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NATURAL HISTORY.

BIRDS.

By P. H. GOSSE.

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Birds

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PREFACE.

In presenting to the public the second of this series of volumes on Natural History, which treats of the many-voiced and many-coloured tribes that wing their way through the air, it is only necessary to observe, that the Author has pursued the same plan as that which he adopted in treating of the *Mammalia*. The systematic divisions of modern science are adhered to; and their distinctive characters succinctly, but correctly, and clearly given; while every Family is illustrated by the description, history, and pictorial delineation of one of its constituent species.

These illustrations have again been selected in preference from the Zoology of the British Islands; a course which has been practicable to a much greater extent in the present than in the former volume; for while of the forty-four Families into which the *Mammalia* are divided, only

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twenty are represented in these islands, of the forty-nine Families of Birds no fewer than thirty-one possess British representatives.

The Author has followed in his arrangement and nomenclature, the "Genera of Birds" of Mr. G. R. Gray; not only on account of the intrinsic authority of that work, but because it is the system on which the noble collection of Birds in the British Museum is arranged and named. The advantage, presented by this volume and its fellows, of being a Manual to the National Collection, will be readily appreciated.

Besides the carefully executed engravings of every species described in the following pages, many others, illustrating peculiarities of structure, &c., are scattered through the book.

LONDON, 1849.

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NATURAL HISTORY.

BIRDS.

THE numerous Class of vertebrated animals which we are about to consider, differs from that of the *Mammalia*, in that the young are not born alive, but are produced from *eggs;* which consist of a living point, attached to a globular sac of nutriment, called the yolk, surrounded by a layer of *albumen*, the glaire, and inclosed in two series of membrane, and a hard calcareous shell. For the development of the vital point into a living and active chick, it is needful that it should receive the stimulus of warmth; and this is, in general, supplied from the body of the parent bird, during the process of brooding or incubation; while it is retained, in most cases, by means of *nests*, in which the eggs are deposited, and which are composed of substances more or less calculated to resist the rapid abstraction of heat by the surrounding atmosphere. During the process of incubation, which lasts only a few weeks, the yolk is gradually absorbed into the body of the inclosed chick, forming its sustenance, until

it is ready for exclusion; when, by means of a horny, pointed scale, attached temporarily to the tip of its beak, it succeeds in breaking the egg-shell, and forcing its passage into liberty. Some species, as those of the gallinaceous and swimming tribes, are able to run about, and pick up their own food, immediately after their escape from the egg; but more commonly the newly-excluded young are callow and helpless, for several days, unable to quit the nest; and are assiduously fed and tended by the parent birds, with a care which has become proverbial.

In the general structure of their skeleton, Birds agree with Quadrupeds, but in many important particulars it is modified to suit widely different habits, and another sphere of action. Birds are flying animals: their sphere of activity is the air; and their whole organization (we speak not of exceptions) is adapted to a continued suspension in so subtle a medium, and to rapid motion through it. The skeleton unites lightness with firmness; the great bones of the limbs, and many of those of the body, are hollow reservoirs of air communicating with the lungs. Various irregular membranous sacs which can be filled with air, are also distributed about the body; some internally, others between the muscles and the skin, down the throat and chest, or along the tendons of the shoulder: and these communicate with each other, and with the lungs. These

last named organs are likewise proportionally very large, arranged along on each side of the spine, and occupying the hollows between the bases of the ribs. By this great development of the respiratory system, the blood is more rapidly and effectually oxygenised, and muscular energy greatly increased for the action of flight; while by the animal heat thus evolved the air contained in the complex apparatus described is rarified, and so the body is increased in bulk, but relatively diminished in weight.

The wings of a Bird correspond to the arms and hands of man; but the hand is composed of but two fingers and a thumb, all of which are rudimentary. From the bones of the hand arise the *primaries*, or quill-feathers properly so called, which are ten in number; these are the largest and strongest feathers of the wing, and the character and power of flight is indicated by their form, stiffness, and relative length. From the principal bone of the fore-arm arise the *secondaries*, the number of which varies in different species; they are usually shorter, broader, and more flexible than the primaries; and are less removed in form from the general clothing feathers of the body. The bone of the upper-arm (*humerus*) gives rise to another series of feathers, called *tertiaries:* these, in some birds, particularly the Plovers, Curlews, &c., are greatly lengthened; they are, however, still weaker in their structure

than the secondaries. Attached to the little bone which represents the thumb are two or three short and very stiff feathers, called the *winglet;* they lie upon the basal part of the first primaries at the very edge of the wing. Corresponding to these series of feathers there are, both on the outer and inner surface of the wing, several rows of smaller ones, called *coverts*, from their office of covering the basal part of the quills.

The feathers of the wing, overlapping each other, present a continuous surface of great breadth, with which the repeated strokes upon the air are performed, which constitute flight. Each feather is concave, whether we regard it transversely or longitudinally; its stem, or midrib, is remarkably strong, though very light, and the beards, which present their edges in the direction of the stroke, are linked to each other by a series of minute hooks. All of these provisions increase the power of the wing in its downward strokes upon the resisting air.

To use these broad fans with sufficient force to impel the bird through the air, large and vigorous muscles are required. Accordingly, in Birds, particularly those of long and powerful flight, the greatest portion of the whole muscular force of the animal is concentrated upon these organs. The muscles which produce the downward stroke of the wing are enormous; and, for their attachment, the breast-bone is not only

greatly enlarged, but its surface is still further increased by its medial portion rising into a high perpendicular keel or ridge, the two faces of which, from their direction, afford a point of resistance, or *purchase*, of peculiar advantage.

To resist the tendency of the shoulders to be drawn together by the powerful muscular action exerted during flight, there is inserted between the two bones (*coracoids*) to which the shoulder-blades are attached, a singular bone of an arched form, well known as the *merry-thought*. In the common fowl, which flies but little and weakly, this bone is feeble, but in birds of vigorous flight, as the Hawks, the Swallows, and the Humming birds, it is very strong and elastic. On the other hand, where the bird never rises upon the wing, as in the case of the Ostrich, Emu, and kindred birds, this bone is reduced to a mere rudiment.

The posterior extremities also differ materially in structure from those of quadrupeds. The general number of toes is four, which is never exceeded; but a few birds have but three, and the Ostrich but two. For the most part, three toes are directed forwards, and one, answering to the great toe, backwards. The climbing birds, as the Parrots and Woodpeckers, have the outer toe also reversed; while the Swifts have all the four turned forwards. The feet are much more lengthened than in the *Mammalia* generally,

especially the tarsal portion, which is never applied to the ground in the action of walking.

Though many birds feed on hard substances, their jaws are entirely destitute of teeth; but are more or less extended into two mandibles, and incased in horny coverings of considerable density, which are exceedingly diversified in form and use. "Thus in birds of prey [the beak] well executes the office of a dissecting knife; in seed-eating birds it forms a pair of seed-crackers for extricating the kernel from the husk which envelopes it; in the Swallows and Goat-suckers it is a fly-trap; in the Swans, Geese, and Ducks, it is a flattened strainer, well furnished with nerves in the inside for the detection of the food remaining after the water is strained, by that particular operation which every one must have observed a common duck perform with its bill in muddy water. In the Storks and Herons we find it a fish-spear; and in the Snipes and their allies it becomes a sensitive probe, admirably adapted for penetrating boggy ground, and giving notice of the presence of the latent worm or animalcule."* The stomach in Birds consists of three parts (which are not, however, in all cases distinctly developed); the crop or craw, the membranous stomach or *proventriculus*, and the gizzard. The last, which is seen to advantage in the grain-eating birds, is composed of two very

* Penny Cyclop.; Art. BIRDS.

dense and powerful muscles of a hemispherical form, whose flat faces, coated with a thick skin, work over each other like a pair of millstones, and by the aid of small angular stones, sand, &c., swallowed for the purpose, grind down the hardest substances in a very short time.

With the exception of the beak and the hinder extremities, every part of a Bird is, for the most part, clothed with feathers. The feet are protected by a naked, scaly skin, which in some species extends partly up the lėg (*tibia*). The soles of the toes are covered with a callous modification of this skin, having a granular surface. The plumage of Birds attracts universal admiration, for its beautiful fitness for the ends it answers, for its softness, its smoothness, its compactness, and for its ever varied hues. The most brilliant colours in nature are lavished upon the feathers of these tenants of the sky; embellished and set off in some instances with a peculiar reflection that rivals the lustre of burnished metals, or the radiance of precious stones.

Every one is familiar with the general form of a feather. "When a bird has just left the egg, its covering is a downy kind of hair, several little bundles taking their rise from one common bulb. This is the origin of the future feather. A dark cylinder soon makes its appearance, from the upper extremity of which the sprouting feather emerges, while the lower extremity receives the

blood-vessels which supply the vascular nourishing pulp of the barrel. When this pulp has performed its office, and the stalk and other parts of the feather are fully developed, it shrivels up into the well-known substance, which every one finds in a quill when he cuts it for the purpose of making a pen."*

As in the *Mammalia*, the classification of Birds into Orders is founded upon the organs connected with motion and food; that is to say, the characters are taken principally from the beak and feet. The subordinate divisions depend chiefly upon the form of the beak, and pass into each other by almost imperceptible gradations, insomuch that there is no other class of animals in which the genera and sub-genera are so little susceptible of definite limitation.

In the present work we shall adopt the Orders enumerated in the "List of the Genera of Birds" of Mr. G. R. Gray, which are eight in number, viz., *Accipitres*, *Passeres*, *Scansores*, *Columbæ*, *Gallinæ*, *Struthiones*, *Grallæ*, and *Anseres*.

* Penny Cyclop.; Art. BIRDS.

ORDER I. ACCIPITRES.

(*Birds of Prey.*)

Like the carnivorous quadrupeds, these birds are fitted, by their structure, for a life of rapine. For the most part they feed on living flesh, derived from quadrupeds, birds, reptiles, or fishes, which they pursue and capture by their own strength and prowess. Their natural weapons are not less effective than those with which their mammalian representatives are armed. The beak is strong, crooked, with the point acute and curving downward, and the edges trenchant and knife-like; their feet also are very muscular, and the four toes are armed with powerful talons, long, curved, and pointed, of which those of the hind and innermost toes are the strongest. In the family of the Vultures, however, which feed on the flesh of animals already dead, these characters are much less developed, particularly those which belong to the talons, the true weapons of the more raptorial kinds, the beak being used in both mainly as an instrument of dissecting the food, not of slaying it.

The base of the beak is enveloped in a naked skin, called the *cere*, in which the nostrils are pierced: the stomach is simple, consisting of a membranous sac without a muscular gizzard. The breast-bone is broad, and in most cases completely ossified, without openings, so as to afford a greater

attachment to the muscles of the wings, which are long and powerful. Hence the flight of these birds is usually vigorous, lofty, and long sustained.

FOOT OF EAGLE.

Contrary to what usually prevails among birds, the females in this order are one-third larger than the males. Their eggs are generally pure white, free from spots.

The *Accipitres* are found in every part of the world. They comprise three well-marked Families, *Vulturidæ*, *Falconidæ*, and *Strigidæ*.

Family I. Vulturidæ.

(*Vultures.*)

We have just observed, that the birds of this Family are not strictly rapacious, inasmuch as their organization unfits them for violence; but their food consists of dead flesh, which in hot countries, where the Vultures chiefly occur, so quickly attains putridity as to have induced the notion that they feed exclusively on carrion. We have proved, however, by personal observation, that decomposition is not a necessary condition of the Vultures' food, for they may be frequently seen regaling themselves on the flesh of an animal within half an hour after it has been killed.

"The *Vulturidæ*," observes Sir William Jardine, "have universally been looked upon with a kind of disgust. Ungraceful in form, of loose and ill-kept plumage, and except when satisfying the cravings of hunger, or during the season of incubation, of sluggish and inactive manners, they present nothing attractive, while carrion being generally mentioned as their common food, associations have been created of the most loathsome character. They are not, however, without utility, for, in the warmer regions of the world, they consume the animal remains, which, without the assistance of these birds, the more ignoble carnivorous quadrupeds, and the myriads of carcase-eating insects, would soon spread pestilence around." *

The beak, in the *Vulturidæ*, is somewhat lengthened, and curved downward at the point:

* Nat. Lib.—Ornithology, vol. i. p. 91.

the talons are comparatively weak, and but slightly hooked: the head, and sometimes the neck, in a greater or less degree, are naked, or clothed only with a thin down; as is also the skin that covers the stomach. The wings are powerful and ample, and the general plumage is remarkably stiff and coarse.

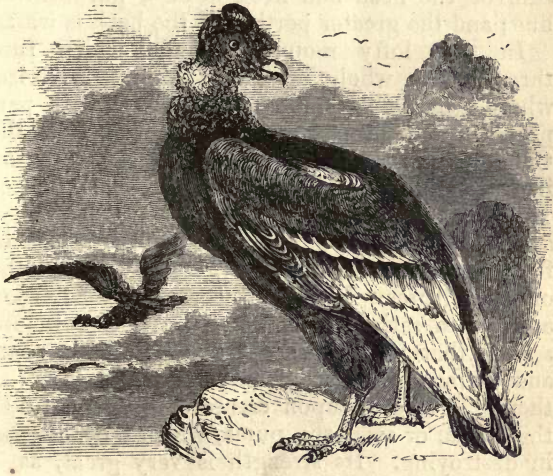
The Vultures are widely scattered over the globe, but most abound in the regions that lie between the tropics. There they may generally be seen at all times of the day, soaring on motionless wings at a prodigious elevation, wheeling round in large circles with a peculiarly easy and graceful flight, as they reconnoitre the distant earth below. The senses of sight and smell they possess in great perfection, and notwithstanding the assertions of Mr. Audubon, that the former only is put in requisition by them, there is abundant evidence that these birds are guided to their food by the olfactory organs, as well as by those of vision.

Genus *Sarcoramphus*. (Dum.)

In this genus, which is confined to America, and comprises but three species, the beak is large and strong; the nostrils are oval, and placed longitudinally at the edge of the cere; the latter, as well as the forehead, is surmounted by a thick and fleshy comb or *caruncle;* the third quill-feather is the longest; the hind toe is very short.

We illustrate this genus by the far-famed Condor of the Andes, (*Sarcoramphus gryphus*, Linn.), which, owing to exaggerated reports of its dimensions from the early European travellers, was formerly supposed to be identical with the fabu-

lous Roc, of the Arabian nights, "who, as authors report, is able to trusse an elephant." It is not surprising that this bird, seen in the wildest and most magnificent scenes, far above ordinary objects of comparison, should have drawn upon the imaginations of those who observed it. Nestling in the most solitary places, often upon the ridges



CONDOR.

of rocks which border the lower limits of perpetual snow, and crowned with its extraordinary comb, the Condor, for a long time, appeared to the eyes of the scientific Humboldt, as a winged giant, and he declares that it was not until he had actually measured a dead specimen, that the optical illusion was corrected. Still it is an immense

bird: there seems no doubt that individuals have actually been measured, the expanse of whose wings reached to eleven feet, and whose length from beak to tail was between three and four feet. The general colour of the Condor is a glossy black, but the greater part of the wing in the male is white, as is a ruff of soft loose feathers that encircles the base of the neck. The naked skin of the head and neck is of a purplish-red hue; and the greater portion of the beak is white.

In that lofty mountain range which runs through the whole length of South America, whose inaccessible summits are covered with perpetual snow, even beneath a vertical sun, the Condor delights to dwell, fixing his habitation in solitary grandeur at the height of 10,000 or 15,000 feet above the level of the sea. Here they are to be seen in pairs, or groups of three or four, but never associate in large numbers, like the other Vultures. It does not confine itself to dead animals to satisfy its appetite. Mr. Darwin observes, that it will frequently attack living goats and lambs; and two of them are said to unite their efforts even upon creatures so powerful as the llama, or even the puma, which they succeed in destroying. Its strength is very great, as is also its tenacity of life.

The graceful motions of these Vultures in the air, are thus graphically described by Mr. Darwin: —"When the Condors in a flock are wheeling round and round any spot, their flight is beautiful. Except when rising from the ground, I do not recollect ever having seen one of these birds flap its wings. Near Lima, I watched several for nearly half an hour, without once taking off my

eyes. They moved in large curves, sweeping in circles, descending and ascending without once flapping. As they glided close over my head, I intently watched from an oblique position the outlines of the separate and terminal feathers of the wing; if there had been the least vibratory movement, these would have blended together, but they were seen distinct against the blue sky. The head and neck were moved frequently, and apparently with force; and it appeared as if the extended wings formed the fulcrum on which the movements of the neck, body, and tail acted. If the bird wished to descend, the wings were for a moment collapsed; and then when again expanded with an altered inclination, the momentum gained by the rapid descent seemed to urge the bird upwards, with the even and steady movement of a paper kite. In the case of any bird soaring, its motion must be sufficiently rapid, so that the action of the inclined surface of its body on the atmosphere may counterbalance its gravity. The force to keep up the momentum of a body moving in a horizontal plane in that fluid (in which there is so little friction) cannot be great; and this force is all that is wanted. The movement of the neck and body of the Condor, we must suppose, is sufficient for this. However this may be, it is truly wonderful and beautiful to see so great a bird, hour after hour, without any apparent exertion, wheeling and gliding over mountain and river."

Mr. Darwin supposes that the Condor breeds only once in two years, that it lays two large white eggs on the bare rock, and that the young are very long in coming to maturity.

Family II. Falconidæ.

(*Falcons.*)

The structure and habits of the Falcons display the highest development of the destructive faculty. The feet are eminently formed for striking and trussing, and the beak for dissecting their prey, which, with scarcely an exception, consists of living animals; and for the pursuit and conquest of these, the birds before us are endowed with vigorous limbs; the wings being for the most part long, dense, and capable of powerful flight, and the feet strong and muscular, and armed with formidable talons. In almost all cases they obtain their prey by the exercise of their own energies, either striking it down upon the wing, or pouncing upon it on the ground: all the vertebrated animals that they can overcome and kill are their victims, though some species are more restricted in their choice than others, and a few even feed upon large insects. In a state of freedom no rapacious bird would eat any other than animal food, and if it were placed in circumstances where this could not be obtained, it would probably die of hunger, rather than voluntarily have recourse to any other diet. Yet the experiments of John Hunter prove that there is no physical impossibility in the case. "That the Hawk-tribe can be made to feed upon bread, I have known," says that distinguished anatomist, "these thirty years; for to a tame Kite I first gave fat, which it ate readily; then tallow and butter; and afterwards small balls of bread rolled

in fat or butter; and by decreasing the fat gradually, it at last ate bread alone, and *seemed to thrive as well as when fed with meat.* . . . . Spallanzani attempted in vain to make an Eagle eat bread by itself; but by enclosing the bread in meat, so as to deceive the Eagle, the bread was swallowed and digested in the stomach."*

The characters of this Family may be thus expressed:—The head is wholly clothed with feathers, except the *cere* at the base of the beak. The beak is strong, hooked, and, in the more typical genera, furnished with a sharp projection or tooth on each side. The nostrils are more or less rounded, and pierced in the sides of the *cere*. The eyebrow, in most instances, projects and overhangs the eye; imparting an expression of sternness to the countenance. The outer toe is to some extent connected with the middle toe, and all are armed with strong, very sharp, and much curved talons, the points of which are preserved from injury by a mechanism for elevating them from the surface on which the bird rests; a process analogous to the sheathing of the claws in the *Felidæ*.

BEAK OF FALCON.

In general the female is much larger than the

* Animal Œconomy.

male adult; and the plumage of the young bird often differs greatly from that of mature age; both of which circumstances have tended not a little to introduce confusion into the natural history of this Family. The members composing it are widely scattered over the globe; and several species have been reclaimed, and trained to pursue their game at the command of man. The amusement of falconry occupied a very large share of the attention of Europe during the middle ages.

Genus *Aquila*. (Briss.)

We select the Eagles as the representatives of the *Falconidæ*, not because they possess the family characters in the highest degree of development, a distinction which belongs to the genus *Falco*, but because their great size and strength, combined with somewhat of grandeur and dignity in their aspect, movements, and habits, have, in all ages and countries, given them a place of high consideration among birds.

This genus is characterized by having the beak somewhat lengthened, somewhat angular above, straight at the base, but much curved towards the tip: the notch or tooth of the upper mandible is almost obliterated; the nostrils are oval, and placed transversely; the *cere* is somewhat rough; the wings have the fourth and fifth quills the longest; the feet are stout and powerful, the *tarsi* feathered to the toes; the claws are remarkably strong and curved, the under surface grooved; the hind and outer claws longest.

The Eagles are widely scattered. They are birds of lofty and powerful, but not rapid flight.

From the latter circumstance, they usually prefer to strike their prey on the ground, the weight of their bodies rendering them unfitted for pursuing a flying prey through its quick and tortuous evolutions. They breed in solitude, on the inaccessible crags of precipitous mountains.

The Golden Eagle (*Aquila chrysaetos*, LINN.) is the noblest species of the whole Family, for size, strength, and courage. It has been esteemed

GOLDEN EAGLE.

by nations widely separated as the emblem of majesty and power: the might of the Babylonian empire was described under this image in Sacred Prophecy; * the iron legions of Rome in ancient,

* See Jer. xlviii. 40, xlix. 16; Ezek. xvii. 3, &c.

and the veterans of Napoleon in modern times, have fought and conquered beneath their eagle-standards; while at this day the Highland chieftain and the Indian Sagamore alike glory in the eagle's plume as the most honourable ornament with which they can be adorned.

This magnificent bird is about three feet in length; its plumage is of a deep and rich umber-brown, glossed on the back and wings with purple reflections; the feathers of the head and neck are narrow and pointed, of an orange-brown hue, and when shone upon by the sun, have a brilliant, almost golden appearance. The tail is barred with grey and obscure brown; but, in youth, the basal portion of the tail is white, with the tip dark brown; and in this plumage it has been often described as a distinct species, by the name of the Ring-tailed Eagle.

The Golden Eagle is found throughout the middle and north of Europe, and also in North America: in the highest mountain ranges of our own country it was formerly much more common than it is now; but in the wildest parts of the Scottish Highlands it is still a frequent ornament of their sublime scenery. The ravages committed among the flocks at lambing time, when the Eagles have young to feed, have, however, made the destruction of these noble birds an object of constant effort. In the three years ending March, 1834, one hundred and seventy one old Eagles, besides fifty-three young and eggs, were destroyed in the county of Sutherland alone, so that their numbers must be rapidly diminishing. In Ireland it appears to be still numerous; and Mr. Thompson enumerates several situations

known as the eyries or breeding-places of this species.

"The eyry," observes Sir William Jardine, "is placed on the face of some stupendous cliff situated inland; the nest is built on a projecting shelve, or on some stumped tree that grows from the rock, generally in a situation perfectly inaccessible without some artificial means, and often out of the reach of shot either from below or from the top of the precipice. It is composed of dead branches, roots of heather, &c., entangled strongly together, and in considerable quantity, but without any lining in the inside; the eggs are two in number, white, with pale brown or purplish blotches. During the season of incubation, the quantity of food that is procured and brought hither is almost incredible; it is composed of nearly all the inhabitants, or their young, of those wild districts called forests, which, though indicating a wooded region, are often tracts where, for miles around, a tree is not seen. Hares, lambs, and the young of deer and roebuck, grouse, black-game, ptarmigan, curlews, and plovers, all contribute to the feast."

In the technical language of falconry, the Eagle was considered "ignoble," as not being capable of training for service in that sport. But the following interesting note, by Mr. Thompson, proves that however savage and indocile it may be when caught in adult age, the Eagle is not difficult to be reclaimed, if trained from the nest:—"My friend Richard Langtry, Esq., of Fortwilliam, near Belfast, has at present a Golden Eagle, which is extremely docile and tractable. It was taken last summer from a nest in Invernesshire, and

came into his possession about the end of September. This bird at once became attached to its owner, who, after having it about a month, ventured to give it its liberty, a privilege which was not on the Eagle's part abused, as it came to the lure whenever called. It not only permits itself to be handled in any way, but seems to derive pleasure from the application of the hand to its legs and plumage. The Eagle was hooded after the manner of the hunting-hawks for some time, but the practice was abandoned; and although it may be requisite, if the bird be trained for the chase, hooding is otherwise unnecessary, as it remains quiet and contented for any length of time, and no matter how far carried on its master's arm. It is quite indifferent to the presence of any persons who may be in his company, and is unwilling to leave him even to take a flight, having to be thrown into the air whenever he wishes it to do so. When this Eagle is at large he has only to hold out his arm towards it, which, as soon as perceived, even at a distance, it flies to and perches on. I have seen it thus come to him not less than a dozen times within half an hour, without any food being offered."*

Family III. Strigidæ.

(*Owls.*)

With the general structure and anatomy resembling those of the *Falconidæ*, we find in the birds about to be considered, striking modifications in external characters, fitting them for ac-

* Mag. Zool. and Bot. ii. 46.

tivity during the diminished light of the dusk or night. They have the head very large, with great, dilated, and projecting eyes, looking forwards, each surrounded by a concave disk formed of singular diverging feathers. Behind these disk-feathers is the opening of the ear, which in these birds is of immense size, and of elaborate construction. If we separate the feathers that form the hinder part of the disk, we shall expose the great ear enclosed between two valves of thin skin, from whose edges these feathers grow, and which are capable of being widely opened at the will of the bird, to catch every sound that may give notice of its prey amidst the silence and darkness. The plumage is lax and downy, a character that extends even to the wing-quills; whence the flight of the Owls is unattended with any sound produced by the striking of the air. Even the outer primary has the barbs of its edge separated like the teeth of a saw, allowing a passage to the air. The colours of the plumage are, for the most part, sombre, consisting of various tints of dull yellow, and brown, or white; often spotted, or minutely and most delicately pencilled: a peculiarity of coloration that we find in most nocturnal birds, and, by a beautiful analogy, in the moths and sphinges among Insects.

Mr. Yarrell observes, that from the loose and soft nature of the plumage in these birds, as well as their deficiency in muscle and bone, rapid flight is denied them as useless, if not dangerous, from the state of the atmosphere at the time they are destined to seek their food; but that they are recompensed for this loss, partly by their acute sense of hearing, from the structure of the ear

and the size of its orifice, and partly by the beautifully serrated outer edge of the wing-primaries; which, allowing them to range without noise through the air, enables them to approach unheard their unsuspecting victim, which falls a prey to the silent flight and piercing eye of an inveterate enemy.*

Some of the species are distinguished by having a series of feathers more or less lengthened, on each side of the top of the head, which can be erected at pleasure; when raised they have a very distant resemblance to horns, or to the erect ears of a cat, and hence these species are familiarly spoken of as horned or eared Owls.

Owls are dispersed over all parts of the globe; and several of the species enjoy a wide geographical range.

Genus *Strix*. (Linn.)

This genus, which is considered as exhibiting the peculiarities of the nocturnal birds of prey in the highest degree of development, is well illustrated by the most common British species of the Family, the White, or Screech Owl. Several species, very slightly differing from this, are found in various parts of the world, which may be characterized as having the head very large, without any tufts of erectile feathers, but with the face-disks very complete, and of great width; their extent is marked by dense semicircles of rigid narrow feathers, forming a sort of collar, with turned ends, lying close upon each other in the manner of scales. The orifice of the ear, which is within this collar, is also large, as is the ear-

* Zool. Journ. vol. iii.

flap (*operculum*). The beak is lengthened and curved only towards the point. The *tarsi* (or that part of the foot which is raised, commonly, but erroneously, called the leg) are rather long, and feathered; the toes are clothed with hairs.

The Owls of this genus are eminently nocturnal; their enormous facial disks, and great black eyes with dilated pupils, give them a very peculiar appearance; their colours are generally white and pale buff, marked and speckled with bluish-grey. Their voices are loud and discordant.

SCREECH OWL.

The Screech Owl (*Strix flammea*, LINN.), called also the Barn Owl, is common throughout the

British islands, and is spread over Europe, with the exception of the extreme northern regions. Though viewed with some prejudice, it is a very useful bird, preying nearly, if not quite, exclusively, on the small quadrupeds, rats, mice, and voles, that are so annoying and injurious by their depredations. Its habit of retiring into holes and crevices by day occasionally leads it to resort to the pigeon-house, the little caverns of which must present an inviting appearance to this darkness-loving bird; hence it is often accused of preying upon the young pigeons, and crimes are laid to its charge which have been really committed by other birds, or by rats. Mr. Waterton observes, that "if this useful bird caught its food by day, instead of hunting for it by night, mankind would have ocular demonstration of its utility in thinning the country of mice, and it would be protected and encouraged everywhere. When it has young it will bring a mouse to the nest every twelve or fifteen minutes; . . . formerly I could get very few young pigeons till the *rats* were excluded from the dove-cot; since that took place it has produced a great abundance every year, though the Barn Owls frequent it, and are encouraged all round it;" and he adds, that the pigeons do not regard it "as a bad or suspicious character."

Mr. Thompson, in a pleasing account of a Barn Owl that had built in a dove-cot, confirms this view of its innocence and usefulness. "The White Owl," he observes, "is a well-known visitor to the dove-cot, ... and in such a place, or rather a loft appropriated to pigeons, in the town of Belfast, ... a pair once had their

nest. This contained four young, which were brought up at the same time with many pigeons. The nests containing the latter were on every side, but the Owls never attempted to molest either the parents or their young. As may be conjectured, the Owl's nest was frequently inspected during the progress of the young birds; on the shelf beside them, never less than six, and often fifteen mice and young rats (no birds were ever seen;) have been observed; *and this was the number they had left after the night's repast.* The parent Owls, when undisturbed, remained all day in the pigeon loft." *

The food of the Owl is generally swallowed whole; and the bones and hair, and other indigestible parts are afterwards rejected through the throat, pressed into hard and dry pellets. In places where a pair of Owls have long been accustomed to resort, these castings accumulate in vast heaps.

Like others of this Family, the White Owl is remarkable for the harshness of its voice. During flight it will occasionally utter frightful screams. Mr. Yarrell says that it does not *generally* hoot; but Sir William Jardine, who shot one in the act of hooting, asserts, that at night, when not alarmed, hooting is its general cry. It also snores and hisses, and when annoyed, snaps its beak loudly.

The White Owl lays five or six eggs, but not all at once, for she lays after some young are already hatched; so that young birds, advanced eggs and fresh-laid eggs may be frequently found in the same nest. The eggs are as large as those of a hen, of a rounded form and pure white.

* Mag. Zool. and Bot. ii. 178.

ORDER II. PASSERES.

(*Perching Birds.*)

Though for the most part the birds of this Order are of smaller size than those of the others, yet the immense number of species included in it, which is about equal to that of all others together, renders it the most important of all. It is also considered by naturalists as the most typical; that is, as displaying the properties which distinguish a bird from other animals, developed in the greatest perfection. Great varieties of form and structure are found in a group so immense as this; so that but few positive characters can be assigned which are at the same time common to the whole, and peculiar to them. The power of grasping the branches and twigs of trees with the feet, and the habit of perching upon these, are prominent in the Order; the hind toe is always present, and the claws are not capable of being elevated, as in the birds of prey. The greater number of the species habitually dwell in woods and thickets. The power of flight exists throughout the Order in full perfection, and in some of its genera, as the Swifts and the Humming-birds, may be considered as at its greatest development. The beak varies greatly in form, but its general shape is that of a cone, more or less lengthened. In some of the genera which retain predaceous propensities, a trace of the tooth which marks the upper

mandible of the Falcon, remains in a notch near the tip; a mark which is obliterated by imperceptible gradations. The food of the Passerine birds embraces a wide variety of substances, but yet the vast majority feed either upon insects or upon vegetable seeds; and in almost every instance these are procured by the beak alone, without the aid of the feet.

To this Order, with scarcely a single exception, belong the birds whose voices are uttered in notes of melody. Every one is acquainted with the song of a bird; and there are, probably, few whose hearts are not in some degree open to the sweet and soothing influence of its associations. To walk out on a sunny morning in early spring, and listen to the lark as he soars up invisibly into the bright sky, or to the broken whistle, so rich and mellow, of the blackbird, among the yet bare and leafless twigs of the grove; or, by and bye, when the forest has put on its verdure, to walk through its leafy bowers, when thousands of throats are pouring forth their sweet warblings around,—this is indeed delightful.

> "'Tis pleasant, 'tis pleasant in greenwood-shade,
> When the merle and the mavis are singing."

The song of birds seems to be connected with the passion of love. In a wild state birds do not in general sing, except during the pairing season, when the trilling forth of their wild melodies appears to be designed to please and cheer their mates. Some naturalists think that the particular notes which constitute the distinctive melody, in any given species, are the result of imitation alone, being handed down by what we may call tradition; and that if a young bird were brought

up without ever having heard the song of its species, it would be destitute of it.

It is in this Order, also, that we find the instinct of nest-building most perfectly displayed. The specimens of nests which are prepared, we can hardly say *built*, by other birds, are rude structures, consisting mostly of loose aggregations of rough materials with scarcely an attempt at construction. But very many of the Passerine birds build most elaborate and elegant structures, of which we may mention as instances, the compact felted nests of the Humming-bird, of the Goldfinch, and of the Bottle-tit, and the woven purses of the Orioles and the Starlings.

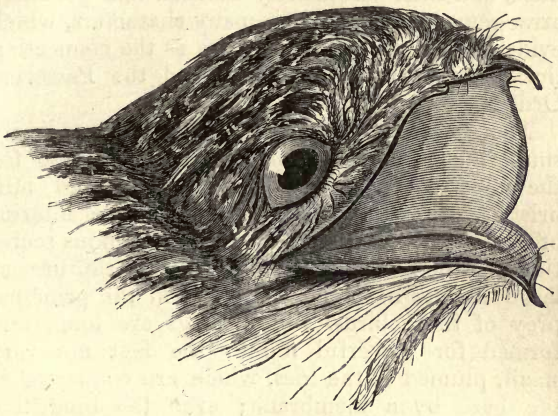
The study of this immense assemblage of species is facilitated by its sub-division into four Tribes, characterized by the varying form of the beak, and named respectively *Fissirostres*, *Tenuirostres*, *Dentirostres*, and *Conirostres*.

TRIBE I. FISSIROSTRES.

The beak in this Tribe is short, but broad, and more or less flattened horizontally, often hooked at the tip, with the mouth very deeply cleft: the upper mandible is not notched. The feet are small and feeble. Most of the species feed on insects, which they capture on the wing, but one genus subsists on fishes.

The tropical regions are the principal home of the fissirostral birds; such species as reach to the temperate zone, are, for the most part, migratory

visitors, retiring on the approach of winter to more genial climes. Many of the species are distinguished for the brilliant hues which adorn their plumage.



HEAD OF NYCTIBIUS JAMAICENSIS.

The six Families of the *Fissirostres* are *Caprimulgidæ*, *Hirundinidæ*, *Todidæ*, *Trogonidæ*, *Alcedinidæ*, and *Meropidæ*.

Family I. Caprimulgidæ.

(*Nightjars.*)

The analogy between these birds and the Owls has been observed not only by naturalists, but even by the vulgar, as the common names of our native species, Fern Owl, Churn Owl, &c., indicate. Indeed, the nocturnal flight, the feathered

feet, the large ears and eyes, as also the sort of disk that surrounds the face, and the saw-like edge of the first wing-quill, observable in some species, the downiness of the plumage, its sombre but varied hues, and their exquisitely mottled and pencilled arrangement, all form so many characters, which evidently point to the Nightjars as the connecting link between the Accipitrine and the Passerine Orders.

The *Caprimulgidæ* have the beak exceedingly small, but the gape enormous; its sides are for the most part furnished with long and stiff bristles, which point forwards, and the interior of the mouth is moistened with a glutinous secretion. All these provisions aid the capture of large insects in flight, which form the principal prey of these birds. The wings are long, and formed for powerful flight; the feet are very small, plumed to the toes, which are connected at the base by a membrane; even the hind toe, which is directed inwards, is thus joined to the inner toe. The claw of the middle toe, in most of the genera, is dilated on one side, and its edge is cut into regularly formed teeth, like those of a comb.

The voices of the Nightjars, like those of the Owls, are often harsh and uncouth; but their utterance frequently possesses a vibratory or quivering character that is peculiar. With a single exception, they are nocturnal in their activity. Their eggs are laid on the ground, with but a slight mat of loose materials in place of a nest. The species are widely spread; and some of those which inhabit tropical countries have remarkable appendages to some of their feathers.

Their colours are usually various shades of black, brown, grey, and white, mingled in the most beautiful manner, with minute waves, lines, and spots.

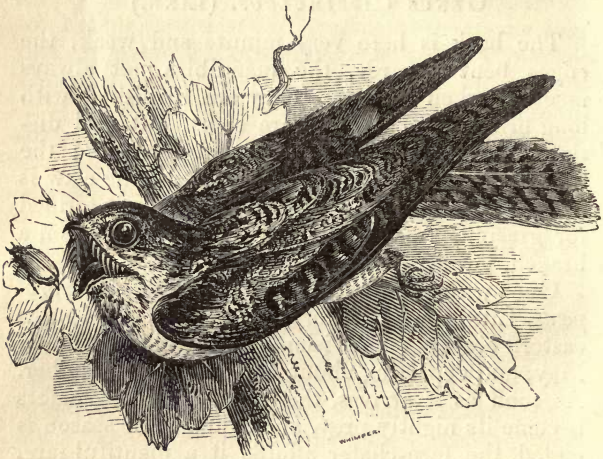
Genus *Caprimulgus*. (Linn.)

The beak is here very minute and weak, the edges bent inwards, the mandibles not always meeting when closed. They are furnished with long bristles. The tarsi are short, but still distinct. All the toes are directed forwards; the inner and outer toes are equal; the middle claw is pectinate or comb-like. The foot is not formed for grasping; hence the birds sit lengthwise on a branch, not across it.

Our own beautiful Nightjar (*Caprimulgus Europæus*, Linn.) is migratory, arriving on the south-eastern coasts of this island about the middle of May, and departing about the end of September. As soon as it arrives, the swarms of cockchafers become its nightly prey, and when their season is ended, the fern-chafer affords it a plentiful fare. Moths also, and other night-flying insects, are pursued by it, particularly around the summits of trees, and are readily engulfed in its cavernous mouth, surrounded by divergent bristles. It has been supposed, at least sometimes, to take its flying prey with its little foot, and deliver it to its mouth; and the securing of the insect in this manner has been thought one object of the serrated claw.

It frequently sits on a branch or a fence-rail, and, with the head held as low as the feet, utters, with swollen, quivering throat, its singular jarring note, for a long space at a time, without

seeming to draw breath. "As this song," says Mr. Jesse, "is a summer incident, the naturalist hears the first return of it with complacency; not from its melody, for it has none; but from



NIGHTJAR.

the pleasing association of summer ideas to which it gives rise." "Instead of being noxious and mischievous," continues this pleasing writer, "they are the most harmless and useful of birds, destroying the great enemies of vegetation, the *scarabæi* and *phalænæ*, which, though individually feeble, yet are of mighty efficacy in their infinite numbers, inflicting wide devastations on the grass and corn, and stripping whole groves, woods, and extensive forests of their foliage at once, so as to make them look as naked as in winter." "Their

wings and tails are very long, by means of which they excel in sudden evolutions; and they can mount instantaneously from a level flight, like a sky-rocket. . . When flushed in sunshine, they drop again at once, so as to be in danger of being caught by spaniels, and look round them with astonishment; hence a notion prevails that they are foolish birds."*

Like many other birds, the female Nightjar, if suddenly surprised by an intruder, when she has young, will feign helpless lameness, tumbling along in an odd manner, to lure away the stranger from the centre of her anxious cares, by the hope of capturing her.

Family II. Hirundinidæ.

(*Swallows.*)

In the smallness of the beak, and the great width of the gape, the Swallows resemble the Nightjars, as they do also in the weakness and minuteness of their feet. They are birds, however, of far more powerful wing, and though they too pursue insects, which are captured and devoured during flight, yet as their season of activity is wholly confined to daylight, their plumage has neither the lax softness, nor the mottled style of coloration common to nocturnal birds. On the contrary, the plumage of the Swallows is always close and smooth, and very often burnished with a metallic gloss; while its prevailing colours are black (more or less changing into blue or green)

* Gleanings in Nat. Hist. 295.

above, and white (often varied with dull red) beneath.

The organs of flight are developed in a very high degree. Almost the whole life of these birds is passed in the air; from earliest "morn to dewy eve," we see them careering along in their rushing flight, and, as has been truly observed, they "dash along apparently as untired when evening closes, as when they began their aërial evolutions with the first dawn of day." They even drink on the wing;—sipping the pool or stream as they skim lightly over its surface. The feet, therefore, being little called into action, are small and weak; yet, as these birds frequently cling from rocks and walls, when they do rest, their toes are furnished with sharp and crooked claws, and the hind-toe can, either wholly, as in the Swifts, or partially, as in the common Chimney Swallow, be brought to point forward.

The Swallows, though widely dispersed over the globe, are eminently children of the sun: they extend, it is true, over the temperate zone, and even reach the Arctic Circle, but it is only in the summer season; on the approach of cold weather, they retire to the torrid climes of equatorial regions. The Swift, which is the most impatient of cold of our visitors, does not appear in England until May, and hastens to depart before the end of August. In almost all the European languages the connection of these birds with a bright and fervid sun, is embodied in the well-known proverb,

"One Swallow does not make a summer."

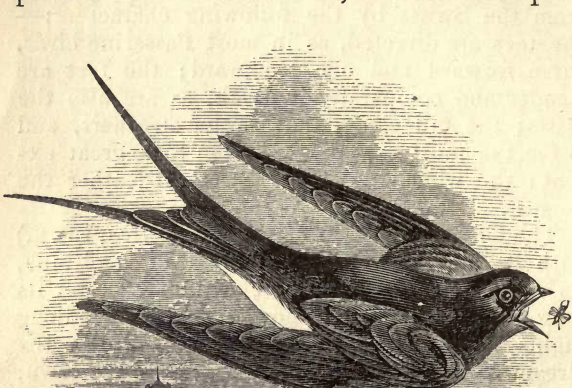
Genus *Hirundo*. (Linn.)

The Swallows and Martins are distinguished from the Swifts by the following characters:—the toes are directed, as in most Passerine birds, three forward and one backward; the feet are slender and comparatively weak, as are also the claws; the tail consists of twelve feathers, and is for the most part forked, often to a great extent; the wings have the first quill-feather the longest.

The Chimney Swallow (*Hirundo rustica*, Linn.) with its burnished upper plumage of steel-blue, its forehead and throat of chestnut-red, and its long forked tail, is well known; and its headlong flights and rapid evolutions as it plays over the stream or rushes through the streets of the town, are hailed as the attendants of summer. Who does not know the pleasant associations of the announcement, "The Swallows are come!" "The Swallow," says Sir Humphrey Davy, "is one of my favourite birds, and a rival of the Nightingale; for he glads my sense of seeing as much as the other does my sense of hearing. He is the joyous prophet of the year, the harbinger of the best season; he lives a life of enjoyment among the loveliest forms of nature; winter is unknown to him, and he leaves the green meadows of England in autumn for the myrtle and orange groves of Italy, and for the plains of Africa."

In the "Natural History of Selborne," the economy of this, as well as of our other species of *Hirundinidæ*, is detailed in an interesting manner. The Chimney Swallow usually arrives in this

country about the 13th of April, and withdraws about the beginning of October, though stragglers often appear before, and linger after these periods. It builds with us, for the most part,



CHIMNEY SWALLOW.

in chimneys, but occasionally also it attaches its clay-built structure to the rafters of barns and outhouses, or within the shaft of an old well, or of an unworked coal-pit. "Five or six feet down the chimney does this little bird begin to form her nest, about the middle of May, which consists, like that of the House Martin, of a crust or shell composed of dirt or mud mixed with short pieces of straw to render it tough and permanent; with this difference, that whereas the shell of the Martin is nearly hemispheric, that

of the Swallow is open at the top, and like half a deep dish: this nest is lined with fine grasses and feathers, which are often collected as they float in the air.

"Wonderful is the address which this adroit bird shews all day long, in ascending and descending with security through so narrow a pass. . . . The progressive method by which the young are introduced into life is very amusing: first, they emerge from the shaft with difficulty enough, and often fall down into the rooms below: for a day or so they are fed on the chimney-top, and then are conducted to the dead leafless bough of some tree, where, sitting in a row, they are attended with great assiduity, and may then be called perchers. In a day or two more they become fliers, but are still unable to take their own food; therefore they play about near the place where the dams are hawking for flies; and when a mouthful is collected, at a certain signal given, the dam and the nestling advance, rising towards each other, and meeting at an angle; the young one all the while uttering such a little quick note of gratitude and complacency that a person must have paid very little regard to the wonders of nature, that has not often remarked this feat." *

Family III. Todidæ.

(*Todies.*)

The Todies constitute a small Family almost confined to the tropics, but found in both hemispheres. They are marked by having the beak

* Nat. Hist. Selb.; Letter xviii. 2nd series.

broad, and very much flattened, usually blunt or rounded at the tip. The gape is wide, extending beneath the eyes, and is beset with bristles. In one Indian genus (*Eurylaimus*) the breadth of the beak at the base is nearly as great as the length. The feet are for the most part small and weak: the outmost toe is united to that which is next to it as far as to the terminal joint. The wings are short and rounded, and consequently the flight is feeble, and incapable of protraction.

Insects form the chief nutriment of the Todies, mingled, however, in some of the species, with berries.

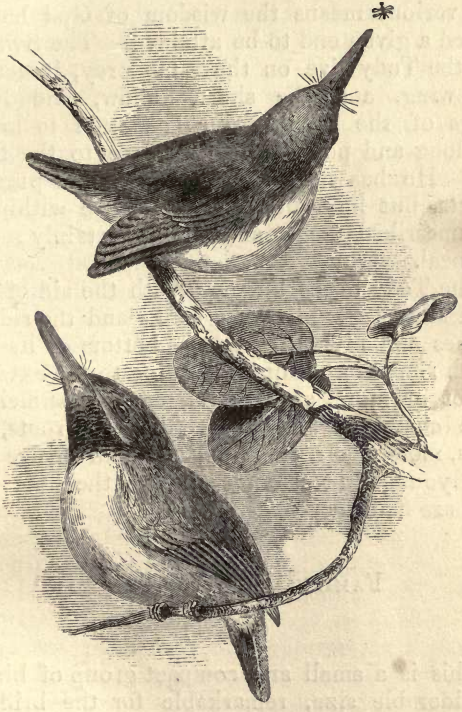
Genus *Todus*. (Linn.)

The little birds to which this name is generically restricted, are confined to the islands of the West Indies and the tropical parts of the American continent. The species are few in number, and are characterized by a lengthened, flattened beak of nearly equal breadth throughout, but rounded at the point. The bristles of the gape are few. The wings are very short and rounded, and the feet weak.

The Green Tody (*Todus viridis*, Linn.) is one of the most common, and one of the most beautiful birds of the greater West Indian isles. Its upper plumage is of bright green,—brilliant as an emerald,—its throat rich velvety crimson, and its under parts pale yellow, with rosy sides.

It sits on a twig at the edge of the forest, or on some low bush by the side of the road, watching for passing insects: and so intent is it on its occupation, and so little terrified by the approach of man, that it will allow a person to stand within

a few feet of it without moving; and it is not uncommon for the negro boys to creep up behind one and actually to clap their hands over the



GREEN TODY.

unsuspicious bird as it sits. But this abstraction is more apparent than real: if we watch it, we shall see that the odd-looking grey eyes are glan-

cing hither and thither, and that ever and anon, the bird sallies out upon a short feeble flight, snaps at something in the air, and returns to his twig to swallow it. It is instructive to note by how various means the wisdom of God has ordained a given end to be attained. The Swallow and the Tody live on the same prey, insects on the wing, and the short, hollow, and feeble wings of the latter are as effectual to him as the long and powerful pinions are to the Swallow. He has no powers to employ in pursuing insects, but he waits till they come within his circumscribed range, and no less certainly secures his meal.

The Tody forms burrows, with the aid of both beak and claws, in earthy banks and the sides of ditches and ravines. At the bottom of its hole, which runs in a winding direction to the extent of a foot or more, and terminates in a sufficiently wide chamber, it collects fibres of roots, dry grass, moss, and cotton, and lays four or five eggs. The young do not emerge from the hole until they are fledged.

Family IV. Trogonidæ.

(*Trogons.*)

This is a small and compact group of birds of considerable size, remarkable for the brilliancy and beauty of their plumage. The colour of the upper parts is for the most part green, which reflects the splendour of burnished metal, while that of the under parts is frequently of the richest hues, blood-red, scarlet, rose-pink, orange,

or yellow; set off, especially on the broad and lengthened tail, with variations of black and white, in the most delicate and elaborate pencillings.

The Trogons have the toes set as in the climbing birds, two before and two behind, yet they have not the habit or power of climbing; the feet are short and feeble. The wings also are short, but pointed; the quill-feathers are rigid, but the general plumage is very soft and plumose. The beak is short, somewhat conical, robust; the tip and generally the edges are notched or toothed; the gape is wide. The general form is full and plump, to which the dense and soft character of the plumage contributes; the head is rather large; the tail is long and ample; the feathers are graduated, regularly decreasing in length outward, and in one genus (*Calurus*) the tail-coverts are enormously developed, so as to conceal the tail, and depend in narrow flowing plumes of great length.

The food of the Trogons consists principally of insects. "They seize," observes Mr. Gould, in his splendid Monograph of this Family, "the flitting insect on the wing, which their wide gape enables them to do with facility; while their feeble tarsi and feet are such as to qualify them merely for resting on the branches as a post of observation whence to mark their prey as it passes, and to which, having given chase, to return. . . . Denizens of the intertropical regions of the Old and New World, they shroud their glories in the deep and gloomy recesses of the forest, avoiding the light of day and the observation of man; dazzled by the brightness of the

meridional sun, morning and evening twilight is the season of their activity."

Genus *Trogon*. (Linn.)

The Trogons proper, which are confined to the hottest regions of South America, are distinguished by having the cutting edges of the beak both above and below, cut into notches: the fore toes are united as far as the first joint; the tarsus is feathered to the toes; the nostrils are concealed by bristles.

Shy and recluse in their habits, the Trogons are among the few birds that delight in the lone and sombre recesses of the forest. Even here they prefer to sit in the centre of a tree where the foliage is densest, rarely descending to the ground, or even to the lower branches. Azara, speaking of one species (and they seem to be much alike in their manners), observes, that it sits for a long time motionless, watching for insects that may pass within its reach, and which it seizes with adroitness; it is not gregarious, but dwells either in solitude or in pairs: its flight, which is rapid, and performed in vertical undulations, is not prolonged. These birds are so tame as to admit of a near approach; and they are even sometimes killed with a stick. They do not migrate, and are never heard, except in the breeding season; their note then consists of the frequent repetition of the syllables *pee-o*, in a strong, sonorous, and melancholy voice; the male and female answer each other. They form their nest on the trees, by digging into the lower part of the nest of a species of ant or *termes*, until they have made a

cavity sufficiently large, in which the female deposits her eggs, of a white colour, and two, or as some assert, four in number. Azara has seen the male clinging to a tree after the manner of woodpeckers, occupied in digging a nest with his beak, while the female remained tranquil on a neighbouring tree.

GRACEFUL TROGON.

We select for illustration the Graceful Trogon, (*Trogon elegans*, GOULD,) of which the upper parts and breast are golden-green, and the lower

parts rich scarlet; a white crescent crosses the chest; the outer tail-feathers are white, minutely barred with black; the secondaries and all the coverts of the wings are grey, delicately pencilled with black; the forehead and throat are black, and the beak light yellow. This beautiful bird is a native of Mexico.

Family V. Alcedinidæ.

(*Kingfishers.*)

While in the brilliant little Kingfisher of our own streams we trace a very manifest resemblance to the Todies, we find in the construction of its beak, and especially in its increased power, an indication of very different habits. The Kingfishers are the most predatory of the Fissirostral tribe; our native species is a voracious devourer of fishes, and while most of the Family have similar instincts and appetites, there are not wanting species in which the beak is greatly enlarged, whose rapacity is formidable, even to reptiles, birds, and small quadrupeds.

The Family before us is characterized by a long, stout, pointed beak, with angular sides; small and feeble feet, the outmost and middle toes united to the last joint; wings rounded and hollow, incapable of protracted flight; a robust form, with a large head, and usually a short tail. Their plumage is dense and close, and commonly of blue or green hues. They are scattered over the world, but Australia with the adjacent isles, and South America, contain the greatest number of species.

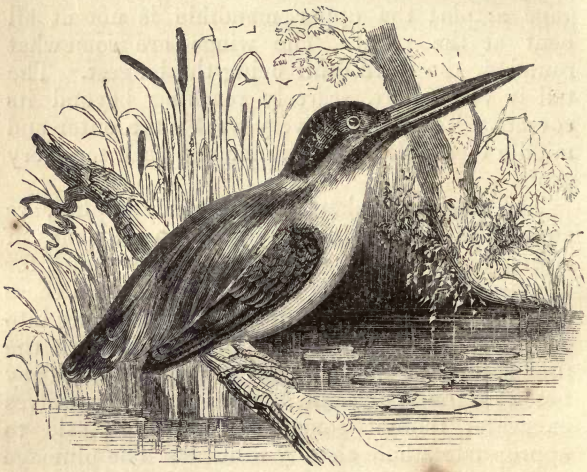
Genus *Alcedo*. (Linn.)

The beak in this genus is very straight, sharp, compressed through its whole length, with the gape ample; the upper mandible is not at all bent at the point. The wings are somewhat rounded, the third quill being the longest. The tail is very short, scarcely reaching beyond its coverts. The feet are very weak; the outer and middle toes united; the inner and back toes very short.

The true Kingfishers, as their name implies, are aquatic in their habits, resorting to the banks of rivers, or to the sea-shore, where they watch for the rise of small fishes to the surface. On these they dart with the rapidity of a stone flung into the water, and rarely fail to emerge with the prey secured in the strong and sharp beak. They breed in holes in cliffs, which they themselves excavate; though sometimes they are said to appropriate a hole already formed. The plumage is blue or green, often varied on the under parts with red or chestnut.

The common Kingfisher (*Alcedo ispida*, Linn.) is well known, particularly in the southern part of our island, wherever there is a secluded and shaded stream. It is, as Sir William Jardine observes, "one of our most gaily tinted birds, and when darting down some wooded stream, and shone upon at times by the sunbeams, it may give some faint idea of the brilliant plumage that sports in the forests of the tropics, and that flits from place to place like so many lights in their deeply shaded recesses." The plumage of the

upper parts is resplendent with emerald green, becoming on the tail ultramarine blue, while the under parts are of a pale orange hue; the throat and neck are varied with white and blue.



KINGFISHER.

The ordinary food of our beautiful Kingfisher is certainly fish; the stickleback and the minnow, with the young of larger species, supply his need; but he is said also to eat slugs, worms, and leeches. The manner in which he procures his prey is graphically drawn in the following picture of his habits by Mr. Martin:—"Occasionally it hovers at a moderate elevation over the water, and then darts down with astonishing velocity and suddenness on some unwary fish, which, heedless of its foe, ventures near the surface, and which is

seldom missed by the keen-eyed bird. The ordinary manner, however, in which the Kingfisher captures its finny prey, is by remaining quietly perched on some stump or branch overhanging the water, and then intently watching, with dogged perseverance, for the favourable moment in which to make its plunge: it marks the shoals of minnows gliding past, the trout lurking beneath the concealment of some stone, or in the shadow of the bank,—the roach and dace pursuing their course. At length, attracted by a floating insect, one rises to take the prize; at that instant, like a shot, down descends the glittering bird, the crystal water scarcely bubbling with its plunge; the next moment it re-appears, bearing its victim in its beak, with which it returns to its resting-place; without loosing its hold, it passes the fish between its mandibles, till it has fairly grasped it by the tail; then, by striking smartly its head three or four times against the branch, ends its struggles, reverses its position, and swallows it whole." *

The Kingfisher, as has been observed, either digs, or selects a hole in some bank, as the scene of its domestic economy. It is always formed in an upward direction, that the accumulating moisture may drain off at the mouth. At the end, which is about three feet from the entrance, quantities of fish-bones are found, ejected by the parent birds, but whether these are placed there with or without design, is as yet a disputed point among naturalists. The prevailing opinion seems to be that the castings are purposely accumulated to form a sort of nest. Six or seven eggs

* Pict. Museum, i. 297.

are laid, and the young do not leave the hole till able to fly, after which they sit on a branch for a few days, and are fed by the parents.

The Kingfisher is partially migratory in this country; and, though some remain with us through the winter, they retire at that time from the rivers and pools, to the estuaries and creeks of the southern coast, where they can still obtain their prey.

Fabulous stories of great antiquity are current concerning this bird; and in country places, even in this country, it is still the object of silly superstitions, which are not worth refuting.

Family VI. Meropidæ.

(*Bee-eaters.*)

We trace, in the lengthened form of the beak in this Family, an approach to the succeeding Tribe of Passerine birds; while yet many of the species have this character modified so as to resemble more the Fissirostral type. The outer pair of toes are united as in the Todies and Kingfishers. The beak is long, slender, tapering, and slightly curved; the wings are long and pointed; the first quill, for the most part, being nearly or quite as long as any other.

The Bee-eaters are generally of a green colour, varied with blue. They associate in flocks, which in their rapid flight, their evolutions, and their long wings and tails, much resemble Swallows. They feed on large insects, which they capture and eat during flight; and are confined to the continents and islands of the eastern hemisphere.

Genus *Merops*. (Linn.)

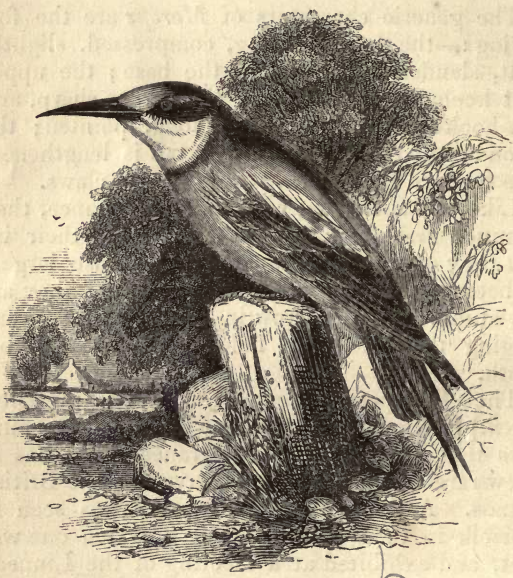
The generic characters of *Merops* are the following:—the beak is long, compressed, slightly bent, slender, but broad at the base; the upper part keeled or ridged; the tip entire, sharp, and not hooked. The wings are long, pointed; the second quill the longest. The tail is lengthened. The feet are short, with strong curved claws.

Like the Swallows, which, in appearance, they so much resemble, the Bee-eaters take their insect-prey on the wing; and as this consists largely of bees and wasps, it is remarkable that they are not stung. They burrow in the banks of rivers, digging their nestling holes to a considerable depth.

The European Bee-eater (*Merops apiaster*, Linn.) is a common summer visitor to the countries that border the Mediterranean, and has in a few rare instances been observed in the British islands. A flock of about twenty was seen in Norfolk in the year 1794, out of which one was shot, and exhibited at a meeting of the Linnean Society. It is a beautiful bird; the upper plumage is of a rich orange-brown, passing into yellow; the throat is yellow, with a collar of black; the wings, tail, and under parts are glossy greenish blue, changing with the play of light.

The prey which the Bee-eater selects has been observed from early times; both the Greek and Roman writers on rural economy have noticed it among the animals whose depredations on the industrious tenants of the hive must be watched against. Its destruction has a double object;

for its flesh is sufficiently esteemed to be sold in the markets both of Italy and Egypt.



BEE-EATER.

Belon, quoted by Ray, writes thus concerning the *Merops*. "Flying in the air it catches and preys upon bees, as Swallows do upon flies. It flies not singly, but in flocks; and, especially, by the side of those mountains where the true thyme grows. Its voice is heard afar off, almost like the whistling of a man. Its singular elegance invites the Candy (Candia) boys to hunt for it with *Cieadæ*, as they do also for those greater swallows

called *Swifts*, after this manner:—bending a pin like a hook, and tying it by the head to the end of a thread, they thrust it through a *Cicada* (as boys bait a hook with a fly), holding the other end of the thread in their hand. The *Cicada*, so fastened, flies nevertheless in the air, which the *Merops* spying, flies after it with all her force, and catching it, swallows pin and all, wherewith she is caught."

TRIBE II. TENUIROSTRES.

The birds of this division have the beak slender, long, compressed, and frequently curved; not notched at the tip. The tongue is often divided at the extremity into two or more filaments, and is commonly used to suck or lick up the nectar of flowers, and to draw in with this honeyed liquid multitudes of minute insects, which constitute the solid portion of their nutriment.

The smallest of the feathered races are found in this Tribe, as well as the most brilliantly adorned; for many of the genera are clothed with a plumage of metallic lustre, and on particular parts of their bodies, especially the forehead and throat, with dense feathers of a peculiar scale-like appearance, which reflect the varying radiance of precious stones. The tribe is eminently tropical in its geographical distribution, although many species visit the temperate zones, and a few are permanent residents of high latitudes.

The tenuirostral Families are the five following:—*Upupadæ*, *Nectariniadæ*, *Trochilidæ*, *Meliphagadæ*, and *Certhiadæ*.

Family I. Upupadæ.

(*Hoopoes.*)

The Hoopoes constitute a small, and somewhat isolated Family, having some relations with the Tribe we have just dismissed. They have an elongated, curved, slender beak, much compressed, but somewhat dilated at the base; the nostrils, which are pierced near the base, are more or less covered with small velvety feathers which point forwards. The feet have the outer pair of toes partially united, as in several of the fissirostral genera. The toes are long and strong, the claws almost straight, that of the hind toe lengthened.

The birds of this Family are few in number, but of rather large size, and have much of the habit and appearance of the Crows. They walk on moist land, as pasture-grounds and newly turned earth, in search for insects and their larvæ; but some species, as those of the genus *Promerops*, seek for minute insects in the corollas of flowers. The Family is confined to the Old World, and most of them are African and Indian.

Genus *Upupa*. (Linn.)

The true Hoopoes have the beak very long and slender, slightly curved through its length, and compressed at the sides: the nostrils are basal, small, covered by a scale, and surmounted by the feathers of the forehead. The wings are long and rounded: the tail long and broad. The toes are three before, and one behind; the hind-toe

long, with a long and nearly straight claw. The head is furnished with an erectile crest.

The birds of this genus reside in Africa and Asia, and one species is a summer visitant of Europe, even as far north as Sweden. They prefer moist situations in the neighbourhood of woods, seeking for insects upon the ground, among manure, and among the foliage of trees.

The European Hoopoe (*Upupa epops*, LINN.) though certainly not a common, is a pretty constant visitor to the British islands; particularly

HOOPOE.

in the later summer months; few seasons now pass without the record of some specimens having been observed; as from their size, their elegant plumose crest, and the striking contrasts of colour

that distinguish them, they are sure to attract attention. White mentions a pair which, one summer, frequented an ornamented piece of ground, adjoining his garden at Selborne, for some weeks. They used to march about in a stately manner, feeding in the walks, many times in the day; and seemed disposed to breed in the outlet; but were frighted and persecuted by idle boys, who never let them be at rest. In a few instances, however, they have been known to breed in England.

The Hoopoe is remarkable for its intelligence, and its susceptibility of attachment: both of which qualities are illustrated by the following interesting, but rather tragical narrative, extracted from Bechstein's "Cage Birds." "With great care and attention," writes M. von Schauroth, "I was able last summer to rear two young Hoopoes, taken from a nest which was placed at the top of an oak-tree. These little birds followed me every where; and when they heard me at a distance shewed their joy by a particular chirping, jumped into the air, or as soon as I was seated, climbed upon my clothes, particularly when giving them their food, from a pan of milk, the cream of which they swallowed greedily; they climbed higher and higher, till at last they perched on my shoulders, and sometimes on my head, caressing me very affectionately. Notwithstanding this, I had only to speak a word to rid myself of their company; they would then immediately retire to the stove. Generally, they would observe my eyes to discover what my temper might be, that they might act accordingly. I fed them like the nightingale, or with the universal paste, to which I sometimes added insects; they would never touch earth-

worms, but were very fond of beetles and may-bugs; these they first killed, and then beat them with their beak into a kind of oblong ball; when this was done they threw it into the air that they might catch it and swallow it lengthwise; if it fell across the throat they were obliged to begin again. Instead of bathing they roll in the sand. I took them one day into a neighbouring field that they might catch insects for themselves, and had then an opportunity of remarking their innate fear of birds of prey, and their instinct under it. As soon as they perceived a raven, or even a pigeon, they were on their bellies in the twinkling of an eye, their wings stretched out by the side of their head, so that the large quill-feathers touched; they were thus surrounded by a sort of crown, formed by the feathers of the tail and wings, the head leaning on the back, with the bill pointing upwards: in this curious posture they might be taken for an old rag. As soon as the bird which frightened them was gone they jumped up immediately, uttering cries of joy. They were very fond of lying in the sun; they showed their content by repeating in a quivering tone, '*vec, vec, vec;*' when angry their notes are harsh, and the male, which is known by its colour being redder, cries, '*hoop, hoop.*' The female had the trick of dragging her food about the room; by this means it became covered with small feathers, and other rubbish, which by degrees formed an indigestible mass in her stomach about the size of a nut, of which she died. The male lived through the winter; but not quitting the heated stove, its beak became so dry that the two parts separated, and remained more than an inch apart; thus it died miserably."

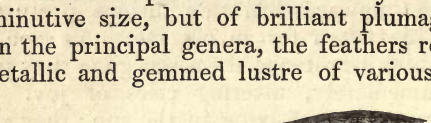
The Hoopoe usually builds in hollow trees, forming a nest of a few stalks and blades of dry grass mingled with feathers; here it lays from four to seven eggs of a pale bluish-grey hue.

Some species of this Family (as the genus *Epimachus*, Cuv.) are remarkable for the singular development of the feathers of the sides, and for the metallic splendour of their scaly or velvety plumage. They rival the birds of Paradise in beauty, and resemble them in some peculiarities of structure; they inhabit also the same region, the immense island of New Guinea.

Family II. Nectariniadæ.

(*Sun-birds.*)

The numerous species of this Family are birds of diminutive size, but of brilliant plumage, at least in the principal genera, the feathers reflecting metallic and gemmed lustre of various hues



HEAD OF NECTARINIA FAMOSA.

in most cases; in some, however, being of rich colours without effulgence. The beak is more or less lengthened, arched, and very slender, generally entire; the tongue, capable of being protruded, is divided at the tip into filaments, sometimes so numerous as to form a sort of pencil or brush, for the purpose of collecting minute

insects from the interior of flowers. The nostrils are short, oval, covered with a membrane, and opening only by a lateral slit. The wings are comparatively weak; the feet of moderate size, formed for perching.

With a few slight exceptions the Sun-birds are peculiar to the Old World, where they represent the Humming-birds, which are peculiar to the New. The typical genus which contains the majority of the species, and these, such as are pre-eminently distinguished for their lustrous beauty, is proper to Africa and India, extending through the great Oriental Archipelago. Some of the genera are spread over the Australasian and Polynesian groups of islands, and of these all are destitute of metallic radiance, and some are of sombre colours.

Genus *Nectarinia*. (Illig.)

The beak in this genus is usually long, slender, and sharp pointed; the base dilated, and the edges minutely cut into regular saw-like teeth. The tongue is long and slender, the edges, for the whole length, turned over inwards, so as to form a double tube, the tip divided into two filaments, which are fringed. The wings are rounded, the first quill nearly obsolete. The tail is broad and rounded, with the middle pair of feathers more or less lengthened and narrowed.

These brilliant little creatures, as we have already observed, are found in Western and Southern Africa, and in the continent and islands of India, some of great beauty extending even to the alpine elevation of the Himalaya mountains.

Their food is obtained principally from the interior of flowers; and they are almost constantly engaged, in small groups, on the twigs of trees and bushes, hopping about with a rapid motion, and at the same time moving their wings in a tremulous manner, while they insert their long beaks into the tubular blossoms in succession. Sometimes they have been observed to hover on the wing before a flower while probing its depths, but this is rare, the ordinary mode of procedure being to cling to the twigs. Occasionally they are seen to snap at a passing insect in the air; and judging from the analogy of the Humming-birds, we should conclude that insects are the principal object of search in the corollas of flowers, the nectarious juice contributing but partially to their support. And this is confirmed by the observations of Dr. Andrew Smith, on some species of Southern Africa:—"The birds of the genus *Cinnyris* (or *Nectarinia*) have generally been regarded as feeding upon the saccharine juices which exist in flowers; but, as far as my experience goes, I should be inclined to consider them as giving a preference to insects. In those I examined I found the bulk of the contents of the stomach to be insects, though at the same time each contained more or less of a saccharine juice. The acquisition of a certain portion of the latter is not easily to be avoided, considering the manner they insert their bill into flowers; but the consumption of insects of such a size as I have found in their stomachs must easily be obviated, provided these were not agreeable to their palates, and not actually a description of food which they by choice selected."

Some of these birds add the charm of song to that of brilliancy of plumage. Freycinet says of some species:—"At night they have a lengthened song, the modulations of which are very agreeable," and the music of one has been compared to that of the Nightingale.

The nest of the Sun-birds is commonly suspended, of a globose form, having an opening on one side, generally near the bottom. Mr. Jerdon, in the "Madras Journal of Science," has thus described that of *Nectarinia mahrattensis*, (LATH.): —"I have seen the nest of this pretty little bird close to a house at Joulnah. It was commenced on a thick spider's web, by attaching to it various fragments of paper, cloth, straw, grass, and other substances, till it had secured a firm hold of the twigs to which the web adhered, and the nest, suspended on this, was then completed by adding other fragments of the same materials; the hole is at the one side, near the top, and has a slight projecting roof or awning over it."

We select, for illustration, the Splendid Sun-bird (*Nectarinia splendida*, SHAW) of West Africa, one of the most gorgeous of the tribe. It is thus described by Sir W. Jardine:—"The back of the neck, shoulders, and upper and under tail-coverts, are brilliant golden green, varying with every change of light; the head and throat are steel-blue, in some lights appearing as black, in others as rich violet; across the breast there appears, in most lights, a band of scarlet, but in some positions it appears as if banded with steel-blue, golden-green, or violet, and at times to be almost entirely composed of one of those tints; this is occasioned by the structure of the feathers;

near the base the colour is of the metallic tints alluded to, but the tips of the plumules are

SPLENDID SUN-BIRD.

lengthened into fine vermilion tips without barbs, which are so slender as sometimes to be entirely

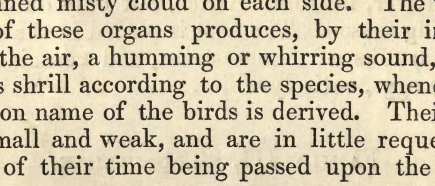
lost, when seen against the dark tint of the feather lying beneath. On the sides of this beautiful bird spring two axillary tufts of pale lemon-yellow. The breast, belly, and flanks, wings, and tail, are deep black, the latter edged with golden-green. In this species, also, the tail-coverts are of an unusual form, very nearly as long as the feathers of the tail, the webs very ample, loose, and unconnected. The legs, feet and bill are black." This species inhabits the country about Sierra Leone; Le Vaillant found it also near the Fish River, in South Africa, but only during the breeding season. The nest is placed in the worm-eaten trunks of mimosa-trees, and contains four or five eggs, entirely white.

Family III. Trochilidæ.

(*Humming-birds.*)

Among vertebrated animals the Humming-birds have an undisputed pre-eminence for beauty; the gorgeous flashings and changing tints, the lustre as of burnished metal, which we have already described in the Sun-birds, being bestowed in still higher perfection and with greater profusion on these. They are also the most minute of the feathered races, many of the species being exceeded both in dimensions and weight, by several English insects. On the other hand, some few species equal a Swallow in size. Their form, too, is elegant and slender, their movements graceful and characterized by the most sprightly vivacity. Their wings are excessively long, and are moved by very powerful muscles, which are attached to a

breast-bone (*sternum*) of great surface in proportion. Hence their flight is swift and vigorous, perhaps in a degree greater than that of any other birds; and it is capable of being long, almost constantly, sustained during day without fatigue. By the inconceivably rapid vibration of these powerful wings, they have the power, possessed by many insects, of poising themselves in the air, where they hang apparently motionless, while their wings, through the extreme swiftness of their oscillations, are rendered invisible, except as an undefined misty cloud on each side. The vibration of these organs produces, by their impact upon the air, a humming or whirring sound, more or less shrill according to the species, whence the common name of the birds is derived. Their feet are small and weak, and are in little request, so much of their time being passed upon the wing.



HEAD OF LAMPORNIS PORPHYRURUS.

The beak is long and slender, sometimes straight, sometimes curved downward, and in one or two species even curved upward. The tongue is slender and capable of protrusion to a great extent; when recent, it presents the appearance of two tubes laid side by side united for half the length, but separate for the remainder. The substance of these is transparent in the same degree as a good quill, which, under a microscope, they much resemble: each tube is formed by a

lamina rolled up, yet not so as to bring the edges into actual contact. Near the tip, the outer edge of each *lamina* ceases to be convoluted, but is spread out, and split at the margin into irregular points, directed backward.

TIP OF ONE FILAMENT OF A HUMMING-BIRD'S TONGUE.

The structure of the tongue is, therefore, essentially the same as in the Sun-birds; and it is applied to the same purposes, the sucking up of the nectar contained in flowers, and with it the minute insects that are always congregated in such situations. In searching these, however, the Humming-bird hovers on his strong vibrating wings in front of the blossom, while with his long protruded tongue he probes its recesses; yet not unfrequently may he be seen to assume the manner of his Oriental representative, and cling with his little feet to a leaf or twig, while he rifles the flowers.

But Humming-birds are also expert fly-catchers, and a great deal of their time is spent hovering in the air in the midst of swarms of very minute flies, snapping them up with many quick turns and sudden contortions. On dissection, their stomachs are usually found to be distended with insects.

The *Trochilidæ* are confined to the New World; and though the tropical regions of that continent, and the lovely islands of the West Indies, are their principal home, yet some species are found to penetrate, at least in summer, to high latitudes

on each side of the equator. Captain King saw one at Tierra del Fuego, sporting in the midst of a snow shower, when the winter had already set in, and the mountains around were covered with snow. Though the species which compose the Family are very much alike in their important characters, yet as they are very numerous, upwards of two hundred species being known, they have been divided into several genera, founded, indeed, on comparatively slight distinctions, as the length and curvature of the beak, the form of the wings, and the greater or less development of the feathers of the tail, and of other parts.

Genus *Trochilus*. (Linn.)

In this genus the beak is of moderate length, slightly curved downward, broad and flattened at the base, and tapering uniformly to the point; the edges of the upper mandible inclosing the lower for the greater part of its length. The tail is forked, but the exterior feather, save one, on each side, is excessively prolonged beyond its fellows.

The Long-tailed Humming-bird (*Trochilus polytmus*, Linn.) is one of the most elegant of this lovely race. Its coral-beak, its double crest of black velvet, its golden back, its ample gorget of scaly plumage, now black, now olive, and now suddenly flashing with the hue of the emerald, and its lengthened tail-plumes of raven-purple,—conspire to give it a pre-eminence in beauty, over many which are adorned with more showy and more varied hues. It is peculiar to Jamaica, but there it is very common, especially in the recluse mountain-gorges of that magnificent island.

LONG-TAILED HUMMING-BIRD.

This Humming-bird is easily captured, as it hovers around the blossoms of the low trees, and, if allowed the liberty of a room, will become so

familiar as to suck from a flower held in the hand, or even to take sugar from the lips, hovering in front of the mouth, or clinging with its tiny feet to the face of the person who feeds it. It will very readily learn to suck from a cup of sugar and water placed in the room, and will amuse itself all day in capturing minute flies, on the wing. We have had half a dozen, or more, in this state of confiding familiarity for several weeks, in the West Indies.

The nests of the Humming-birds are exquisite specimens of the constructive art. Those of the species now before us, are composed ordinarily of the fine down of the silk-cotton tree (*Bombax*), formed into a neat and compact cup. On the outside it is generally bound round in different directions with spider's web, made to adhere by a viscous saliva, secreted by large glands in the mouth of the bird. Little fragments of papery lichen are stuck here and there about the outside, and bound down with web. In this structure, which is usually placed upon a horizontal twig, the twig passing the substance of the bottom, two oval eggs are laid, of the purest and most delicate whiteness, which commonly produce a male and a female.

The Humming-birds of the West Indies, breed all the year round; but in January and June, nests are found in greatest abundance. The young are easily reared by hand, and will readily learn to take syrup from the end of a quill; gnats, ants, and other small insects caught and put into the fluid, and then given to the young bird upon the point of the quill, will add to the probability of success.

Family IV. Meliphagadæ.

(*Honey-eaters.*)

"This extraordinary group," observes Mr. Vigors, "the existence of the much more considerable portion of which was unknown to the Swedish naturalist, for which there was consequently no place in his system, occupies a prominent and important situation in the ornithological department of nature. Chiefly confined to Australia, where they abound in every variety of form, and in an apparently inexhaustible multitude of species, they find a sufficient and never-failing support in the luxuriant vegetation of that country. There the fields are never without blossom, and some different species of plants, particularly the species of *Eucalyptus*, afford a constant succession of that food which is suited to the tubular and brush-like structure of the tongue in these birds. Their numbers and variety seem in consequence to be almost unlimited."*

The Honey-eaters in some measure depart from the tenuirostral type, in the increased strength and stoutness of the beak; this organ is compressed, awl-shaped, and arched; with the tip distinctly notched. The feet are large and strong, the hinder toe much developed. The tongue is still capable of protrusion, but in a subordinate degree; it terminates in a brush of hairs.

These birds are found only in New Holland, and the adjacent islands, where they feed on the nectar and pollen of flowers, on insects, and on

* Linn. Trans. vol. xv.

berries. They are usually of sombre colours, black, or olive-brown, without any metallic lustre. They are said to construct cup-shaped nests, in the forks of small branches of shrubs, not far removed from the ground. They are of a larger size than most of the members of this Tribe; several species equal a thrush in dimensions, and some are considerably larger.

Genus *Meliphaga*. (Lewin.)

Of the typical genus of Honey-eaters the characters are as follow:—The beak is moderate or comparatively short, and feeble; the under mandible is not thickened. The inner toe is shorter than the outer one. The tail is rounded or graduated. The tongue is cleft into two divisions, and each part terminates in a bundle of filaments. This organ, though still essentially constructed upon the type of that which we have described in the Sun-birds and Humming-birds, is of a form almost peculiar to the present group. It is not nearly so extensile as in the Humming-birds, being seldom more than half as long again as the beak, nor are the branches of the tongue-bone (*os hyoïdes*) carried beneath and behind the skull, as in those birds. It seems to be constructed rather for licking up honey, pollen, &c., with its brush-like tips, than for sucking. Lewin, who, in his "Birds of New Holland," drew and described these species in their native regions, has figured the tongue of the Warty-faced Honey-sucker, (*Meliphaga phrygia*, Lath.), and describes the bird as sometimes to be seen in great numbers, constantly flying from tree to tree, particularly

those known as the blue-gum, feeding among the blossoms by extracting the honey, with their long tongues, from every flower as they pass.

WARTY-FACED HONEY-EATER.

Another species the same author describes as being fond of picking transverse holes in the bark of trees, between which and the wood it inserts its long tongue in search of small insects, which it draws out with great dexterity. The analogy which we find in this species with the Woodpeckers is interesting; and is not confined to this

habit, for it is associated with the power of climbing with dexterity, by means of the long and strong hind claw. Mr. Vigors, indeed, considers these birds to represent in Australia the true Woodpeckers, no species of which Family, though a widely scattered one, having been discovered in that continent.

Family V. Certhiadæ.

(*Creepers.*)

There is in this Family a manifest departure from the tenuirostral type, and a decided approach to the following Order, connecting itself very obviously with the Woodpeckers, through the genus *Dendrocolaptes* on the one side, and *Colaptes* on the other. The tongue, though still capable of protrusion, is no longer divided into filaments, but the tip is sharp, horny, and fitted for transfixing insects, which are sought beneath the bark of trees, in crevices of walls, and similar concealed situations. To procure these, the beak also is usually slender, sharp-pointed, and strong, curved in various degrees, sometimes, as in the Wall-creeper (*Tichodroma muraria*, Linn.) of Southern Europe, being almost straight, at others, as in some of the Tree-creepers (*Dendrocolaptes*, Herm.) of Brazil, bent almost to a semicircle.

The Creepers, as their name imports, are true climbers, though their feet have not the typical Scansorial structure. The outer toe is not reversible, but the back toe is considerably longer and stronger than it is in the generality of passerine birds. Mr. Vigors, indeed, arranges them

with the *Scansores*. In several of the genera, the shafts of the tail-feathers are strong and rigid, and their tips are lengthened beyond the barbs, as in the Woodpeckers, and from the same cause, the wearing away of the more fragile parts in the constant friction of the tip of the tail against perpendicular surfaces; this organ being thrown in, and pressed against the tree or wall, as a support in climbing.

Genus *Certhia*. (Linn.)

The beak in this genus is moderately long, more or less curved, triangular at the base, compressed at the sides, slender, and pointed: the wings are moderate, the fourth quill the longest: the tail is lengthened, graduated, the middle feathers the longest; the shafts of the feathers are stiff, and project beyond the tips, which are pointed: the feet are large, the claws slender, that of the back toe long and much curved.

The common Creeper (*Certhia familiaris*, Linn.) is one of the smallest of British birds, being not more than five inches in total length; it is of a yellowish-brown above, the under parts being white. It is generally distributed throughout Europe, as well as through the United States of North America. It is common enough in the British Islands, though, on account of its shy and recluse habits, frequenting large woods, and well-timbered parks, as well as its habit of creeping about the trunks of trees, where its brown hue renders it difficult to be discerned,—it has been accounted rare. Wilson has graphically delineated its manners in the following terms:

" The brown Creeper is an extremely active and restless little bird. In winter it associates with the small spotted woodpecker, nut-hatch, titmouse, &c.; and often follows in their rear, gleaning up those insects which their more powerful

CREEPER.

bills had alarmed and exposed; for its own slender, incurvated bill seems unequal to the task of penetrating into even the decayed wood; though it may enter into holes, and behind scales of the bark. Of the Titmouse, there are generally present the individuals of a whole family, and seldom more than one or two of the others. As the party advances through the woods, from

tree to tree, our little gleaner seems to observe a good deal of regularity in his proceedings; for I have almost always observed that he alights on the trunk near the root of the tree, and directs his course, with great nimbleness, upwards to the higher branches, sometimes spirally, often in a direct line, moving rapidly and uniformly along, with his tail bent to the tree, and not in the hopping manner of the Woodpecker, whom he far surpasses in dexterity of climbing, running along the lower side of the horizontal branches with surprising ease. If any person be near when he alights, he is sure to keep the opposite side of the tree, moving round as *he* moves, so as to prevent him from getting more than a transient glimpse of him. The best method of outwitting him, if you are alone, is, as soon as he alights and disappears behind the trunk, to take your stand behind an adjoining one, and keep a sharp look-out twenty or thirty feet up the body of the tree he is upon, for he generally mounts very regularly to a considerable height, examining the whole way as he advances. In a minute or two, hearing all still, he will make his appearance on one side or other of the tree, and give you an opportunity of observing him."

The Creeper builds early in spring: it selects, for this purpose, some rent or cleft in a tree, where a branch has been broken off, or where a hole has been chiseled by a woodpecker; Sir William Jardine has recorded a case in which a pair built in a stack of peat dried for fuel, and he thinks that holes in walls are sometimes chosen. The nest is composed of dried grass, moss, fibres of slender roots, and feathers, a large quantity of these mate-

rials being sometimes accumulated to fill up a wide rent, so as to form a firm base. Six or eight ash-coloured eggs, marked with dusky reddish spots, are here deposited, on which the female sits very intently, keeping her place during the near presence of an intruder, but watching an opportunity to dart silently away, if his attention is for a moment averted.

The voice of the Creeper is a monotonous cry, not very loud, but frequently and suddenly repeated, especially during its short flights from tree to tree. At the season of incubation the old birds are more than usually noisy. The food on which it subsists consists principally of small beetles, bugs, and flies that habitually conceal themselves in the crevices of bark and similar places: but Wilson mentions having *frequently* found in its stomach the seeds of the pine tree, as well as a large quantity of gravel. The foot and tail of this species show a beautiful adaptation of structure to peculiarities of habit.

TRIBE III. DENTIROSTRES.

The upper mandible of the beak in this Tribe is notched on each side near the tip; in one Family, that of the Shrikes, this indentation is very decided, and accompanied with a projecting tooth, so as to present a connecting link with the *Accipitres*, the beak also being very strong, hooked, and sharp-pointed, and the habits of the birds ferocious and carnivorous. But even in these the

notch is confined to the horny exterior of the beak, no trace of it being to be discovered in the bone, from which, on the contrary, the tooth in the beak of the Falcons is a true process. In other Families, the notch becomes very small, so as at length to be scarcely perceptible; and, in fact, the transition from this Tribe to the *Tenuirostres* on the one hand, and to the *Conirostres* on the other, is so gradual that the points of separation cannot be determined with precision.

HEAD OF TYRANNUS.

The food of the birds of this Tribe consists very largely of insects, though not a few combine with this diet, berries and other soft fruits. None of them feed on hard seeds, which constitute the principal support of the *Conirostres*. With the exception of the single Family of the Finches (*Fringilladæ*) in the Tribe just mentioned, almost all the birds that possess musical notes are found

in the Tribe now before us, of which those renowned songsters, the Nightingale of the Old World, and the Mocking-bird of the New, are members.

The *Dentirostres* are scattered over the whole globe, and are comprised in the following five Families, *Sylviadæ*, *Turdidæ*, *Muscicapadæ*, *Ampelidæ*, and *Laniadæ*.

Family I. Sylviadæ.

(*Warblers.*)

We have here a very extensive and widespread group of small and delicately formed birds, very many of which are noted for their powers of song. Though the habits of so vast a number of species vary considerably, yet in general the Warblers frequent groves and woods, and search for the small insects which constitute their food, among the leaves and twigs, and in the crevices of the bark of trees, rather than on the wing. Mr. Swainson thus describes the habits of these pretty little birds:—"The chief peculiarity which runs through this numerous Family is the very small size and delicate structure of its individuals. Excepting the Humming-birds, we find among these elegant little creatures the smallest birds in the creation. The diminutive Golden-crests, the Nightingale, the Whitethroat, and the Wood-wren, are all well-known examples of genuine Warblers, familiar to the British naturalist. The groups of this extensive Family, spread over all the habitable regions of the globe, are destined to perform an important part in the economy of

nature: to them appears intrusted the subjugation of those innumerable minute insects which lurk within the buds, the foliage, or the flowers, of plants, and, thus protected, escape that destruction from Swallows to which they are exposed only during flight. The diminutive size of such insects renders them unfit for the nourishment of the Thrushes and the larger insectivorous birds; while their number and variety only become apparent when the boughs are shaken and their retreat disturbed. How enormous, then, would be their multiplication, had not nature provided other races of beings to check their increase. No birds appear more perfectly adapted for this purpose than are the Warblers." Mr. Swainson goes on to notice the arrival of these birds in spring, when the increasing warmth is calling the insect world into renewed life and activity, and their departure in autumn, when the hosts of minute insects begin to diminish, and no longer require to be kept within bounds. As different localities seem allotted to different tribes of insects, so similar diversity is observable in the haunts of the various groups of Warblers. Thus the Golden-crests and Wood-warblers (*Sylvianæ*) confine themselves principally to the higher trees, where they search for winged insects among the leaves, or capture them like the Fly-catchers, when attempting to escape. The Reed-warblers and the Nightingales (*Philomelinæ*) haunt the vicinity of waters, or the more dense foliage of hedges, for insects peculiar to such situations. The Stonechats (*Saxicolinæ*), on the contrary, prefer dry commons, and wide extended plains, feeding on insects appropriated to those

localities; while those insects that affect humid and wet places are the chosen food of Wagtails and Titlarks (*Motacillinæ*); and, lastly, the Tits (*Parinæ*) search assiduously among the buds and tender shoots of trees, thus destroying a multitude of hidden enemies to vegetation.*

The birds of this Family have the beak slender, tapering to the point, both of the mandibles having, in most cases, the vertical outline slightly arched, and the lateral outline slightly incurved: the tip is perceptibly notched. Their form is elegant, their plumage fine and close, and their prevailing colours are olive-brown, yellow, and blue, often chastely but beautifully arranged, and sometimes set off with deep black. Their motions are sprightly, but their flight is feeble; yet they are almost all migratory, inhabiting the torrid zone during the winter months, and visiting temperate climates in the spring, where they breed during the summer. We have remarked that most of them are musical, and though of many, the song, if heard alone, would be scarcely thought worthy of admiration, yet, when mingled with many more, each contributes its part to that concert of many notes that fills the groves in spring, and which, though a confused medley of melody, never fails to please, and even charm the auditor.

Genus *Philomela*. (Swains.)

The generic characters of the Nightingales are the following:—the beak straight, the upper edge rounded, the tip slightly bent, and notched; the wings, with the first quill very short, the third

* Classif. of Birds.

longest; the *tarsi* rather long, the feet being formed for walking and hopping as well as for perching. The genus is properly European, extending, however, into the western countries of Asia, and into the north of Africa.

The common Nightingale (*Philomela luscinia*, LINN.), so renowned for its song, even since the

NIGHTINGALE.

time of Homer, is of very plain and unobtrusive plumage. The upper parts are yellowish-brown, tinged with reddish on the crown, as well as on the rump and tail; the under parts greyish-white, purest on the middle of the belly; the beak and feet pale brown.

Though on the continent the Nightingale visits

Sweden, Russia, and even Siberia, yet it does not spread itself over Great Britain. In the south and east of England it is common, from April to September, but does not extend beyond Dorsetshire westward, nor beyond Yorkshire northward. In Wales, Scotland, and Ireland, it is unknown. "Why they should not be found," remarks Montagu, "in all the wooded parts of Devonshire and Cornwall, which appear equally calculated for their residence, both from the mildness of the air and variety of ground, is beyond the naturalist's penetration. The bounds prescribed to all animals, and even plants, is a curious and important fact in the great works of nature. It has been observed that the Nightingale may possibly not be found in any part but where cowslips grow plentifully; certainly, with respect to Devonshire and Cornwall, this coincidence is just."

An attempt made to introduce this admired bird into Scotland, though well conducted, failed of success. Sir John Sinclair, impressed with a notion generally possessed, that the migratory songsters, both old and young, return to their native haunts, season after season, procured as many Nightingales' eggs as he could purchase in Covent Garden market at a shilling each. The eggs being carefully packed in wool, were safely transmitted to Scotland by the mail. Sir John had employed men to discover and watch the nests of several Robins, in places where the eggs might be deposited and hatched in security. The Robins' eggs having been removed, were replaced by those of the Nightingales, which all, in due time, were hatched, and the young brought up by their foster-parents until fully fledged.

After they had flown, the introduced songsters were observed for some time about the vicinity; but in September, the usual period for the departure of the species, they disappeared, and never returned to the place of their birth.

The like disappointment attended a similar essay to introduce the species into South Wales. A few years ago a gentleman of Gower, the peninsula beyond Swansea, procured some scores of young Nightingales from Norfolk and Surrey, "hoping that an acquaintance with his beautiful woods and their mild climate would induce a second visit, but the law of nature was too strong for him, and not a single bird returned."*

Like most of our summer visitors, the male Nightingales arrive in their migration several days before the females, and commence their song immediately. The London bird-catchers are doubly diligent at this time, aware that the males captured after they have obtained mates either do not survive the confinement, or at least continue silent. It frequents the hedge-rows and copses rather than the large woods; around London, the extensive grounds of the market-gardeners are favourite resorts with it. The nest is built either on or near the ground, among decaying leaves, and is rather loosely constructed of dried grass and slender root-fibres. The eggs are of an uniform olive hue, without spots: the young, in their first plumage, are mottled, as in the Thrushes. The song of the parents ceases as soon as the young are hatched, early in June.

The melody of the Nightingale, uttered as it is, though not exclusively, during the solemn

* Yarrell's Brit. Birds, i. 303.

stillness of the balmy night, has been almost universally admired; but whether the notes are plaintive and melancholy, or cheerful and sprightly, opinions are divided. The former epithets are the most commonly applied to them, especially by the poets, who were perhaps influenced by their classic recollections. As an example of the latter judgment, Coleridge may be quoted:—

"A melancholy bird! O idle thought!
In nature there is nothing melancholy:
But some night-wandering man, whose heart was pierced
With the remembrance of a grievous wrong,
Or slow distemper, or neglected love,
(And so, poor wretch! fill'd all things with himself,
And made all gentle sounds tell back the tale
Of his own sorrow,) he, and such as he,
First named these notes a melancholy strain,
And many a poet echoes the conceit.
———— We have learnt
A different lore: we may not thus profane
Nature's sweet voices, always full of love
And joyance! 'Tis the *merry* nightingale
That crowds, and hurries, and precipitates
With fast thick warble his delicious notes,
As he were fearful that an April night
Would be too short for him to utter forth
His love-chant, and disburthen his full soul
Of all its music! . . . . . .
. . . . Far and near
In wood and thicket over the wide grove
They answer and provoke each other's songs,
With skirmish and capricious passagings,
And murmurs musical, and swift 'jug, jug,'
And one low piping sound more sweet than all,
Stirring the air with such a harmony,
That should you close your eyes you might almost
Forget it was not day." *

But perhaps these opinions are not irreconcileable; for, as the Abbé La Pluche says, "the Nightingale passes from grave to gay, from a

* The Nightingale.

simple song to a warble the most varied, and from the softest trillings and swells to languishing and lamentable sighs, which he as quickly abandons, to return to his natural sprightliness."*

A notion has long prevailed that the song of the Nightingale is heard to most advantage in the east, and that it declines in sweetness and richness in proportion as it is found farther to the north and west. Thus the Nightingales of Persia, Turkey, and Greece are said to be more melodious than those of Italy, while the Italian birds are esteemed by amateurs superior to those of France; and these last to those of England. The London fanciers prefer those of Surrey to those taken north of London. Yet, perhaps, this superiority is more fancied than real; and certainly not constant, if we receive the testimony of one familiar with the melody of birds. "In 1802," observes Mr. Syme, "being at Geneva, at the residence of a friend, about three miles from the town, in a quiet, sequestered spot, surrounded by gardens and forests, and within hearing of the murmur of the Rhone,—there, in a beautiful still evening, the air soft and balmy, the windows of the house open, and the twilight chequered by trees, there we heard two Nightingales sing, indeed, most delightfully,—but not more so than one we heard down a stair, in a dark cellar, in the High Street in Edinburgh! such a place as that described in 'The Antiquary;' no window, and no light admitted, but what came from the open door, and the atmosphere charged with the fumes of tobacco and spirits; (it was a place where carriers lodged, or put up,) and the heads of the

* Spec. de la Nature, i. 156.

porters and chairmen, carrying luggage, nearly came in contact with the cage, which was hung at the foot of the staircase;—yet even here did this bird sing as mellow, as sweet, and as sprightly as did those of Geneva. We have often stopped to hear it, and listened with the greatest pleasure, and as the pieman passed with his jingling bell, a sound now seldom heard in the streets of Edinburgh, the bird seemed more sprightly, and warbled with renewed spirit and energy." *

Genus *Motacilla*. (Linn.)

The great extent of the Family *Sylviadæ* induces us to illustrate it by another form, the habits of which differ much in detail from those of the more typical Warblers. The Wagtails have been briefly but graphically described as "an active graceful race, tripping it along the smooth-shaven grass-plots, edges of ponds, and sandy river-shores in unwearied search for their insect food, and with tails which never cease to vibrate as long as their restless little bodies are in action.

The genus *Motacilla*, as now restricted to the Wagtails, is characterized by the beak being slender, nearly straight, slightly entering among the feathers of the forehead; the gape smooth; the wings with the first and second quills longest, the tertiary feathers greatly lengthened, extending nearly to the tip of the closed wing, a peculiarity of such birds, of various Orders, as haunt the borders of shallow water; the legs and feet long, particularly the *tarsi;* the tail very long, and incessantly in

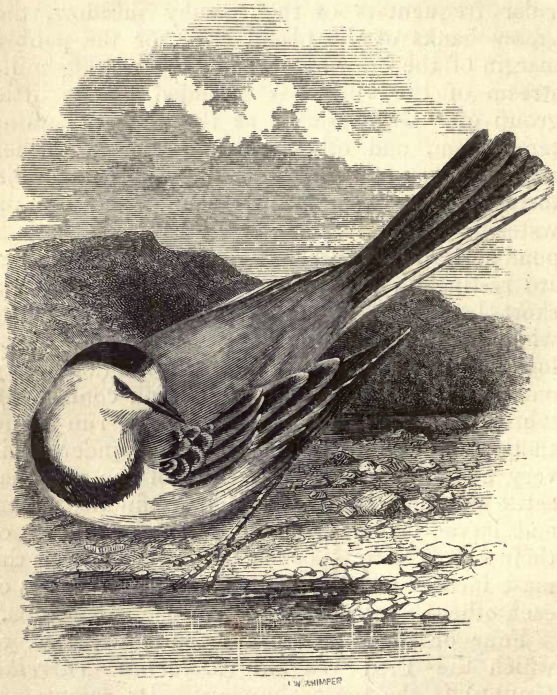
* Syme's Brit. Song-birds, p. 97.

motion up and down. Their colours are chiefly black, white, grey, and yellow, arranged in masses with strong contrasts.

The true Wagtails are well known as the regular frequenters of the marshy meadow, the grassy banks of the placid river, or the pebbly margin of the brawling brook; the roaring mill-stream of the village is attended by its little group of "Dishwashes," as the country swains term them, and others run hither and thither among the rocks that border the lonely mountain torrent. They wade into the shallows to pick up water-insects and their larvæ, as well as small pond-snails and other *mollusca*, run at flies that are resting on the herbage, and pursue with a short low flight such as they arouse to take wing. "When the cows are feeding in the moist low pastures," says White of Selborne (and every one must have seen the observation confirmed), "broods of Wagtails, white and grey, run round them, close up to their noses, and under their very bellies, availing themselves of the flies that settle on their legs, and probably finding worms and larvæ that are roused by the trampling of their feet. Nature is such an economist, that the most incongruous animals can avail themselves of each other! Interest makes strange friendships."

Four or five species are found with us, of which the Pied Wagtail (*Motacilla Yarrellii*, Gould) is the most abundant. Its colours are chiefly black and white; the former spreading over the upper parts, and forming a large patch on the throat and breast: the latter being the hue of the forehead, sides of the head and neck, the lower parts, and the external feathers of the

tail. In winter the black patch on the breast becomes much smaller, and the back turns grey.



PIED WAGTAIL.

The Pied Wagtail is found in all parts of the British islands, subject to a partial migration, on the approach of winter, towards the more

southern counties. On the continent it seems confined to Sweden and Norway, being replaced in the central and more temperate parts by a species closely resembling it, *Motacilla alba*, (Linn.) The eminent zoologist after whom our species has been named, thus describes its manners, in his "British Birds:" "It is ever in motion, running with facility by a rapid succession of steps in pursuit of its insect-food, moving from place to place by short undulating flights, uttering a cheerful chirping note while on the wing, alighting again on the ground with a sylph-like buoyancy, and a graceful fanning motion of the tail, from which it derives its name. It frequents the vicinity of ponds and streams, moist pastures, and the grass-plots of pleasure grounds; may be frequently seen wading in shallow water, seeking for various aquatic insects on their larvæ; and a portion of a letter sent me lately by W. Rayner, Esq., of Uxbridge, who keeps a variety of birds in a large aviary near his parlour-window, for the pleasure of observing their habits, seems to prove that partiality to other prey, besides aquatic insects, has some influence on the constant visits of Wagtails to water. 'I had also during the summer and autumn of 1837 several Wagtails, the Pied and the Yellow, both of which were very expert in catching and feeding on *minnows* which were in a fountain in the centre of the aviary. These birds hover over the water, and, as they skim the surface, catch the minnow as it approaches the top of the water, in the most dexterous manner; and I was much surprised at the wariness and cunning of some Blackbirds and Thrushes, in watching the Wagtails catch the

minnows, and immediately seizing the prize for their own dinner.'" *

The nest of this elegant little bird is commonly constructed of root-fibres or slender twigs, lined with hair, fine grass, and a few feathers; it is generally in the vicinity of water, at a low elevation, rarely on the ground, and in whatever situation is almost always strengthened against some firm support, as a ledge of rock, a bank, the trunk of a tree, or a wall. A hole in a wall, a crevice among loose stones, the interstices of a wood-pile or faggot-stack, the thatch of a cart-shed, or a hay-rick,—these all chosen occasionally; and Mr. Jesse has mentioned in his "Gleanings," the nest of a Wagtail built in one of the workshops of a manufactory at Taunton, amidst the incessant din of braziers who occupied the apartment. It was built near the wheel of a lathe which revolved within a foot of it, and here the bird hatched four young ones. She was perfectly familiar with the well-known faces of the workmen, and flew in and out without fear of them; but if a stranger entered, or any other persons belonging to the same factory, but not to what may be called her shop, she quitted her nest instantly, and returned not till they were gone. The male, however, had less confidence, and would not come into the room, but brought the usual supplies of food to a certain spot on the roof, whence it was brought in to the nest by his mate.

* Yarrell's Brit. Birds, i. 393.

Family II. Turdidæ.

(*Thrushes.*)

The average size of the birds of this Family is considerably superior to that of the Warblers; though the one merges into the other by insensible gradations. The beak is as long as the head, compressed at the sides; the upper mandible arched to the tip, which is not abruptly hooked; the notch is well-marked but not accompanied by a tooth; the gape furnished with bristles. The feet are long, with curved claws. The food on which the Thrushes subsist is less restricted than that of the Warblers; for besides insects and their caterpillars, snails, slugs, earthworms, &c., they feed largely on pulpy and farinaceous berries of many sorts. Many of the species are gregarious during the winter, and some through the whole year. The colours are for the most part sombre, often chaste and elegantly arranged; various shades of olive are the most prevalent hues, very frequently taking the form of spots running in chains, upon the breast and under parts. Exceptions to this subdued character of coloration are not, however, wanting in this extensive Family: thus the Orioles are distinguished for their fine contrasts of rich black and golden yellow; and the Breves (*Pitta*, Temm.) for their dazzling blues and greens, while some of the African Thrushes shine in the metallic lustre of burnished steel.

The *Turdidæ* are found in all parts of the world; the species are very numerous, and a great number are eminent as song-birds.

Genus *Turdus*. (Linn.)

This extensive genus, which restricted as it now is, comprises nearly a hundred and twenty species, is distinguished by having the beak slightly arched from the base to the tip, the notch distinct, and the gape set with weak and fine hairs; the wings are somewhat lengthened, the first quill so short as to be almost rudimentary, the third and fourth longest; the tail of moderate length and breadth; the feet formed for walking as well as perching on trees.

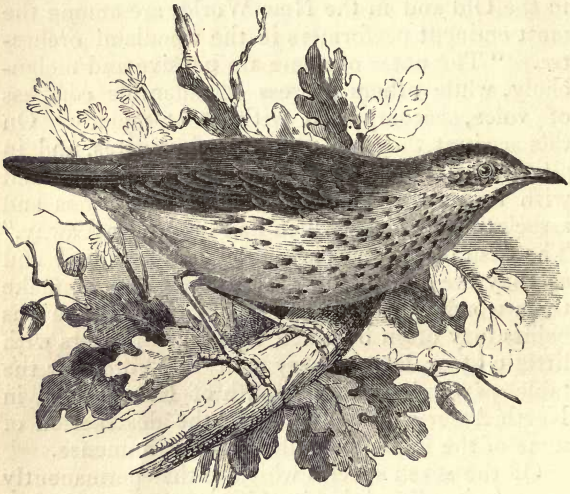
The Thrushes are, to a considerable extent, migratory in their habits, flocks frequently removing from one district of country to another, even in those climates, where the seasons are sufficiently equable to allow of their remaining without inconvenience from the weather. Thus not only do the European species resort to the more temperate parts during winter, and on the approach of summer assemble in great numbers, and return to the more northern regions, but some of the American species are continually roving about in flocks, "innumerable thousands," migrating from one region to another through the whole winter. Their food is very varied; a great portion of it is sought upon the ground, and their feet are admirably formed for walking over the places whither they chiefly resort for this purpose. In winter the various species of slugs and snails, with earthworms and grubs, that are found in open weather in moist woods and meadows, constitute their principal support; but during frosts they subsist on various berries and other

wild fruits. In summer insects are abundant, and especially large caterpillars; for which they resort to the hedges, bushes, and groves. The voices of most of the species are loud and shrill; but many are admired songsters, and some, both in the Old and in the New World, are among the most eminent performers in the woodland orchestra. "The notes of some are pensive and melancholy, while others possess considerable compass of voice, accompanied with great melody. On this account they are universal favourites, and in all countries are listened to with pleasure, and with feelings which recal many recollections and associations of days which had long passed away." The flesh of the species is juicy and savoury; and as they are mostly of a size sufficient to make them worth capturing, and from their gregarious habits may often be taken in great numbers with little cost or labour, very many are killed for the table, particularly in the south of Europe, and in North America; in the latter the destruction of some of the kinds for human food is immense.

Of the seven species which, either permanently or occasionally, inhabit this country, we select for illustration the Song-Thrush or Throstle, or Mavis, (*Turdus musicus*, LINN.) which, though scarcely extending beyond the geographical limits of Europe, is found in every country within it, and is spread over the British Islands, during the whole year round. On the upper parts of the body, its hue is a yellowish brown, on the breast and sides, buff-orange, and on the belly, white; the whole under parts marked with triangular spots of dark brown, running in chains.

The name *Song-Thrush* applied to this species,

as by pre-eminence, no less than its scientific appellation, indicates the prevalent opinion of its powers as a musician, in a Family where nearly all the members are musical. Its notes, usually



SONG-THRUSH.

uttered from the very summit of a tree, and day after day from the very same twig, are loud and clear, with a richness and fulness peculiar to the Thrushes. At morning and evening the woods resound with the melodious chaunt of this charming bird, frequently prolonged into the night; and if the weather be dull, the song is often continued with little intermission through the day. It has been remarked by more observers than one, that a bird's song has not only a character com-

mon to the species, but that individual birds may often be distinguished for superior variety, power, and fulness in their notes; there being as much difference in the execution of birds of the same species, as between human voices singing the same air.

We have already mentioned the various fare on which the Thrushes regale; the species before us, while no less omnivorous, feeds with peculiar relish on shelled snails, and especially the common garden-snail, and the wood-snail (*Helix hortensis, et H. nemoralis*). He breaks the shell against a stone, and extracts the soft animal. Mr. Jesse, in his "Gleanings," has the following observation: — "Thrushes feed much on snails, looking for them in mossy banks. Having frequently observed some broken snail-shells near two projecting pebbles on a gravel-walk, which had a hollow between them, I endeavoured to discover the occasion of their being brought to that situation. At last, I saw a Thrush fly to the spot with a snail-shell in his mouth, which he placed between the two stones, and hammered at it with his beak till he had broken it, and was then able to feed on its contents. The bird must have discovered that he could not apply his beak with sufficient force to break the shell while it was rolling about, and he therefore found out and made use of a spot which would keep the shell in one position." *

The nest of the Song-Thrush is an ingenious structure, for though somewhat rough and loose externally, *within* it presents the appearance of a smooth, hard, cup, quite water-tight. The author

* Jesse's "Gleanings," p. 36.

of "The Architecture of Birds," thus describes its construction from personal observation:—"The interior of these nests is about the form and size of a large breakfast tea-cup, being as uniformly rounded, and, though not polished, almost as smooth. For this little cup the parent-birds lay a massive foundation of moss, chiefly the proliferous and the fern-leafed feather-moss (*Hypnum proliferum et H. filicinum*), or any other which is sufficiently tufted. As the structure advances, the tufts of moss are brought into a rounded wall by means of grass-stems, wheat-straw, or roots, which are twined with it and with one another up to the brim of the cup, where a thicker band of the same materials is hooped round, like the mouth of a basket. The rounded form of this frame-work is produced by the bird measuring it, at every step of the process, with its body, particularly the part extending from the thigh to the chin; and when any of the straws or other materials will not readily conform to this guage, they are carefully glued into their proper place by means of saliva, a circumstance which may be seen in many parts of the same nest, if carefully examined. When the shell, or frame, as it may be called, is completed in this manner, the bird begins the interior masonry by spreading pellets of horse or cow-dung on the basket-work of moss and straw, beginning at the bottom, which is intended to be the thickest, and proceeding gradually from the central points. This material, however, is too dry to adhere of itself with sufficient firmness to the moss, and on this account it is always laid on with the saliva of the bird as a cement; yet it must require no small patience in

the little architect to lay it on so very smoothly, with no other implement besides its narrow pointed bill. It would indeed puzzle any of our best workmen to work so uniformly smooth with such a tool; but from the frame being nicely prepared, and by using only small pellets at a time, which are spread out with the upper part of the bill, the work is rendered somewhat easier.

"This wall being finished, the birds employ for the inner coating little short slips of rotten wood, chiefly that of the willow; and these are firmly glued on with the same salivary cement, while they are bruised flat at the same time, so as to correspond with the smoothness of the surface over which they are laid. This final coating, however, is seldom extended so high as the first, and neither of them is carried quite to the brim of the nest; the birds thinking it enough to bring their masonry near to the twisted band of grass, which forms the mouth. The whole wall, when finished, is not much thicker than pasteboard, and though hard, tough, and water-tight, is more warm and comfortable than at first view might appear; and admirably calculated for protecting the eggs or young from the bleak winds which prevail in the early part of the spring, when the Song-Thrush breeds."*

The nest of this bird is usually built in a thick bush, often an evergreen, as a holly, or in the midst of a clustering ivy; and these are selected, doubtless, because at the early season at which the Thrush builds, the deciduous trees and hedges have not yet put out their foliage, and consequently do not afford the needful concealment.

* Arch. of Birds, p. 125.

There are not wanting, however, numerous instances, in which situations have been chosen, without any regard to exposure. Thus, in the "Magazine of Natural History," it is recorded

NEST OF SONG-THRUSH.

that a mill-wright engaged with three of his men in constructing a threshing-machine for a farmer living near Fife, "wrought in a cart-shed, which they had used for some time as their workshop; and one morning they observed a Mavis enter the wide door of the shed, over their heads, and fly out again after a short while. This she did two

or three times, until their curiosity was excited to watch the motions of the birds more narrowly; for they began to suspect that the male and female were both implicated in this issue and entry. Upon the joists of the shed were placed along with some timber and old implements, two small harrows used for grass seeds, laid one above the other; and they were soon aware that their new companions were employed, with all the diligence of their kind, in making their nest in this singular situation. They had built it, said the workman, between one of the butts of the harrow and the adjoining tooth; and by that time, about seven o'clock, and an hour after he and his lads had commenced their work, the birds had made such progress, that they must have begun by the break of day. Of course, he did not fail to remark the future proceedings of his new friends. Their activity was incessant; and he noticed that they began to carry *mortar* (he said), which he and his companions well knew was for plastering the inside. Late in the same afternoon, and at six o'clock next morning, when the lads and he entered the shed, the first thing they did was to look at the Mavis's nest, which they were surprised to find occupied by one of the birds, while the other plied its unwearied toil. At last the sitting bird, or hen, as they now called her, left the nest likewise; and he ordered one of the apprentices to climb the baulks, who called out that she had laid an egg; and this she had been compelled to do some time before the nest was finished; only plastering the bottom, which could not have been done so well afterwards. When all was finished, the cock

took his share in the hatching; but he did not sit so long as the hen, and he often fed her while she was upon the nest. In thirteen days the young birds were out of the shells, which the old ones always carried off."*

Sir William Jardine records the following anecdote as illustrating the occasional familiarity and unsuspecting confidence of this bird:—"In our own garden, last spring (1837), a somewhat singular circumstance occurred. The nest [of a Song-Thrush] was placed in a common laurel bush, within easy reach of the ground, and being discovered, was many times daily visited by the younger branches of our family. It occurred to some that the poor Thrush would be hungry with a seat so constant, and a proposal was made to supply the want. A good deal of difficulty occurred, from the fear of disturbing her, but it was at last proposed that the food should be tied on the end of a stick; this was done, and the bird cautiously approached and took the first offering. The stick was gradually shortened, and in a few days the Thrush fed freely from the hand, until the young were half fledged. After this, when the parent was more frequently absent, a visit would immediately bring both male and female, who now uttered angry cries, and struck at the hand when brought near the nest."†

In 1833 a pair of Thrushes built their nest in a low tree at the bottom of Gray's Inn Gardens, near the gates, where passengers are going by all day long. The hen laid her complement of eggs, and was sitting on them, when a cat climbed up

* Mag. of Nat. Hist. iii. 238.
† Nat. Lib. ORNITHOLOGY, ii. 93.

and killed her on the nest. The cock immediately deserted the place.

Family III. Muscicapadæ.

(*Flycatchers.*)

The present family seems to form the link by which the *Dentirostres* are connected with the *Fissirostres*. Like the latter, they possess a beak broad at the base, and flattened horizontally, the tip generally hooked, and the gape environed with bristles; like them, their feet are for the most part feeble, or at least not so much developed as the wings; and, like them, they feed upon winged insects, which they capture during flight. They are, however, much more sedentary in their habits; they do not pursue insects in the higher regions of the atmosphere, or wheel and course after them, as do the Swallows, but like the Todies (which have in fact often been placed in this family), they choose some prominent post of observation, where they sit and watch for vagrant insects that may pass within a short distance; on these they dart out upon the wing, but if unsuccessful at the first swoop, rarely pursue it more than a few yards; and if successful, snapping it up with the broad and bristled beak, they return to the very spot whence they sallied out, to eat it. The habit of selecting some particular twig, or the top of a post, or other spot, from which to watch and make their assaults, and to which they return after each essay, is very characteristic of these birds.

The *Muscicapadæ* comprise a vast number of

species, scattered over every part of the globe, and differing widely in the details of generic character. They are all, however, well united together by common peculiarities of structure; and in particular, by the beak being strong, broad, flat, angular on the summit, and notched at the tip, and by the presence of strong hairs or bristles that surround its base.

Genus *Muscicapa*. (Linn.)

In this genus, the only British representative of the great Family to which it belongs, the beak is rather strong, triangular, sharply ridged along the upper edge, moderately dilated at the base, where it is furnished with fine but stiff hairs. The nostrils are placed near the base, are somewhat oval, and partially covered with hairs pointing forwards. The wings are rather long and pointed, the first quill very small and rudimentary, the third longest. The tail is of moderate length, either even at the extremity, or slightly forked. The feet are rather weak, the tarsus and the middle toe somewhat lengthened.

In England we have two species of this genus, of which the Spotted Flycatcher (*Muscicapa grisola*, Linn.) is the most common. The upper parts are dusky brown, the lower parts white, the throat, breast, and sides, spotted with narrow dashes of brown.

The Spotted Flycatcher, though sufficiently abundant throughout Great Britain, is yet only one of our migratory visitors; and its stay with us is among the very shortest. It rarely arrives before the latter end of May, when the summer is

quite set in, and leaves us in September. Mr. Jesse says he has sometimes missed the species within a fortnight from the time at which the brood have quitted the nest, and expresses his

SPOTTED FLYCATCHER.

surprise that such young and tender birds should have strength sufficient to perform their migration. During this its brief sojourn, insects, and especially flies, which constitute its sustenance,

are abundant; the manner in which these are taken is well described by White of Selborne, in his tenth Letter to Pennant. "There is," he observes, "one circumstance characteristic of this bird, which seems to have escaped observation, and that is, it takes its stand on the top of some stake or post, from whence it springs forth on its prey, catching a fly in the air, and hardly ever touching the ground, but returning still to the same stand for many times together." From this circumstance it is in some of the rural districts of England known as the "Post-bird." A dead branch, or the projecting twig of a tree, or the summit of a tall bush, or the angle of the roof of a house, is also not unfrequently chosen as the watch-post, the object being to secure a commanding range of observation on the surrounding air. The captured insect is never swallowed on the wing, but is held for a few seconds in the beak even after the return to the post. Insects have been supposed to be *exclusively* the food of this species, yet Sir William Jardine, whose accuracy of observation cannot be questioned, expressly asserts that he has occasionally seen it eat ripe cherries.

The Flycatcher is one of the least musical of British birds; its only note is a weak monotonous chirp or *click;* and this is uttered only while the season of incubation continues. The utterance, however, such as it is, frequently betrays the presence of the nest, which might else remain undiscovered.

The preparations for the bringing up of their family are commenced by the Flycatchers immediately on their arrival; for they have no time

to lose. Various are the situations selected for the domestic economy: Sir W. Jardine mentions as a very common locality, the branches of a fruit-tree against the garden wall; a niche in the wall; capitals of pillars, or some corner amidst statuary. Mr. Martin also observes, "We have very frequently seen it between the branch of a trained fruit-tree and the wall, or in holes of the wall hidden by foliage. It will build also in the holes of aged gnarled trees, upon the ends of beams in out-houses, and in other appropriate places of concealment." From the selection of beams or rafters in tool-houses, &c., it has obtained in some parts the local appellation of "Beam-bird." But Mr. Jesse has recorded the most singular choice of a breeding locality by this bird. "I have now in my possession," he observes, "a nest of the Spotted Flycatcher, or Beam-bird, which shews the most singular habits of that bird in selecting peculiar and odd situations for building. The nest in question was found on the top of a lamp near Portland Place, London, and had five eggs in it, which had been sat upon. The top of the lamp was in the shape of a crown, and the nest was built in the hollow part of it, but perfectly concealed. In consequence of the great heat produced by the gas, the four props which supported the ornamental crown became unsoldered, and a complaint having been made to the authorities for lighting the streets, the top of the lamp, with the nest in it, was brought to them. The nest was composed of moss, hair, and fine grass. It is not a little curious that it should have been found in such a situation, and with so great a degree of heat under it. Mr. White says

that in outlets about towns, where mosses, lichens, gossamer, &c., cannot be obtained, birds do not make nests so peculiar each to its species, as they do in the country. Thus the nest of the town Chaffinch has not that elegant appearance, nor is it so beautifully studded with lichens as those in the rural districts; and the Wren is obliged to construct its nest with straws and dry grasses, which do not give it that roundness and compactness so remarkable in the usual edifices of that little architect. The nest in question was not lined with feathers and spiders' webs, as is generally the case.

"I have myself discovered the Flycatcher's nest in very odd situations;—one behind a decayed piece of bark attached to an elm tree in Hampton-court Park, and another concealed amongst the ornaments of the beautiful iron gates of Hampton-court Gardens. In Mr. White's unpublished notes, he mentions a Flycatcher having built its nest in a very peculiar manner on a shelf fixed to the wall of an out-house, and behind the head of an old rake lying on the shelf. Indeed the bird would appear to have a partiality for the last mentioned implement, for in Loudon's 'Magazine of Natural History,' it is stated that a Flycatcher's nest was built upon a wooden rake lying on the ground in a cottage garden at Barnsford, near Worcester. In this nest the female laid eggs, and even sat on them, indifferent to any one passing in the garden." *

"A curious circumstance," observes Mr. Yarrell, "in reference to this bird, has been noticed by Thomas Andrew Knight, Esq., the President

* Jesse's "Gleanings," p. 247.

of the Horticultural Society. A Flycatcher built in his stove several successive years. He observed that the bird quitted its eggs whenever the thermometer in the house was above 72°, and resumed her place upon the nest again, when the thermometer sunk below." *

The eggs are four or five in number, of a greyish-white hue, marked with pale orange-brown spots.

Family IV. Ampelidæ.

(*Chatterers.*)

The beak in this Family is more stout in proportion to its length than in the preceding, approaching, especially in the form of the lower mandible, to that of the *Conirostres;* the upper mandible is, however, somewhat broad at the base, flat, with the superior edge more or less angular and ridged, and the tip distinctly notched. The feet are usually stout, with the outer toe united to the middle one, as far as, or beyond the first joint.

The species composing this Family, though not very numerous, are of various forms, and are widely scattered over the globe. Many of them are distinguished for the soft and silky character of their plumage, and for the brilliant colours with which it is adorned; and not a few for unusual appendages, either to some of the feathers, or to the skin of the body. They feed principally on berries, and other soft fruits; occasionally also on insects.

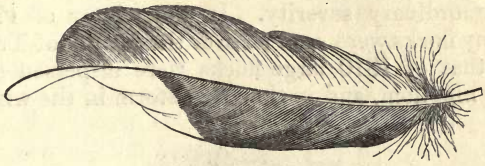
* Brit. Birds, i. 174.

Genus *Ampelis*. (Linn.)

Until recently, the genus before us was known only by two species, one of which is spread over Europe, the northern parts of Asia as far as Japan, and the western portion of North America, as far as the Rocky Mountains; and the other inhabits the Atlantic side of the last-named continent, extending from Canada to Mexico. A third species has, however, of late years, been discovered, of much more limited range, being confined to the remote islands of Japan.

The distinctive characters of this genus may be thus summed up; the beak short, strong, elevated, broad at the base, the upper mandible curved towards its extremity, with a strongly marked notch; the gape very wide; the nostrils oval, covered at the base with feathers, or strong hairs, directed forwards; the wings moderately long, with the first, or the first and second quills longest; the tail short and nearly even; the feet rather short, plumed slightly below the heel, the outmost and middle toes connected. The plumage of the head forms a long and pointed crest, capable of being erected, which is common to both sexes. Two of the species, at least, are distinguished by having singular appendages to the secondaries of the wing, and sometimes to the feathers of the tail; the shaft of the feather being prolonged beyond the vane, and its tip dilated into a flat oval appendage, of a brilliant scarlet hue, and exactly resembling in appearance red sealing-wax. Hence these birds are frequently known by the name of Wax-wings, as from the silky softness and smoothness of the

plumage generally, and particularly of that of the tail, they are sometimes called Silk-tails.



FEATHER OF CHATTERER.

We have alluded to the very wide geographical range of the only species known in Europe, which, from its greater frequency and abundance in the south-east of Germany, is commonly known as the Bohemian Chatterer, or Silk-tail (*Ampelis garrulus*, LINN.). Its occurrence, however, in most of the countries where it has been recognized, is desultory, irregular, and not determined by any known laws. At uncertain intervals they appear in particular districts in immense flocks, and so remarkable have such visitations appeared, that they have been carefully recorded as events of history, and supposed to be in some way ominous of great public calamities. Thus in 1530, 1551, and 1571, vast numbers appeared in northern Italy, and in 1552, along the Rhine, near Mentz, they flew in clouds so dense, as to darken the sun. Of late years, however, in Italy, and Germany, and especially in France, they have been rarely observed, and then only in small flocks that seemed to have strayed from the great body. In 1807 and 1814, they were numerous in western Europe.

In the British islands the Bohemian Chatterer can be considered only as a rare and straggling

visitant, though many instances of its occurrence, and that in some numbers, are on record, more particularly in the north, and during winters of extraordinary severity. In the winter of 1787, many flocks were seen all over the county of York; in that of 1810 large flocks were dispersed over the kingdom, and in the great storm in the winter

BOHEMIAN CHATTERER.

of 1823, several were again observed. In the extreme north of Norway and Sweden, and the icy forests of Russia, they are met with in great numbers every winter, appearing much earlier than in more temperate countries; yet even here they are only migratory visitors, receding from

regions still more inhospitable, which we may conjecture to be those cold and arid plains of great elevation, which occupy the central portion of Asia, or the bleak and barren wilds of northern Siberia.

The Silk-tail is somewhat less than a Thrush; its general plumage is of a vinous or purplish-red hue; the throat is deep black, as is a band on each side of the head; the crown and crest are chestnut brown; the tail and wings are black with yellow tips; the coverts have white tips; some five or six of the secondaries, and, in very old males, some of the tail-feathers also, have the dilated, scarlet appendages to the shafts already alluded to.

The Prince of Canino thus speaks of the habits of this pretty bird. "Besides their social disposition, and general love of their species, these birds appear susceptible of individual attachment, as if they felt a particular sentiment of benevolence, even independent of reciprocal sexual attraction. Not only do the male and female caress and feed each other, but the same proofs of mutual kindness have been observed between individuals of the same sex. This amiable disposition, so agreeable for others, often becomes a serious disadvantage to its possessor. It always supposes more sensibility than energy, more confidence than penetration, more simplicity than prudence, and precipitates these as well as nobler victims, into the snares prepared for them by more artful and selfish beings. Hence they are stigmatized as stupid; and as they keep generally close together, many are easily killed at once by a single discharge of a gun. They always alight on trees, hopping awkwardly on the ground. Their flight

is very rapid; when taking wing they utter a note resembling the syllables *zi, zi, ri,* but are generally silent, notwithstanding the name that has been given them. They are, however, said to have a sweet and agreeable song in the time of breeding, though at others it is a mere whistle."*

The zoologist just cited speaks of the food of these birds in America, as consisting of different kinds of juicy berries, and in summer principally of insects. They are fond of the berries of the mountain ash, and poke-weed (*Phytolacca*), are extremely greedy of grapes, and also, though in a less degree, of juniper and laurel berries, apples, currants, figs, and other fruits. In Britain, Sir William Jardine and other naturalists, mention the various kinds of winter berries, and those of the holly in particular. And Bechstein, noticing its habits in Germany, says, "When wild we see it in the spring eating, like Thrushes, all sorts of flies and other insects; in autumn and winter, different kinds of berries; and in time of need, the *buds and sprouts* of the beech, maple, and various fruit-trees. Indeed, from his account of its manners in captivity, its appetite would seem to be almost omnivorous. His opinion of its character is somewhat less favourable than Prince Bonaparte's. In fact, he draws so unpleasing a picture of its greediness and dirty habits, in his work on Cage-birds, that, if correct, few would desire its captivity. The following is a portion of his observations, omitting what is more repulsive. "During the ten or twelve years that it can exist in confinement, and on very meagre

* Amer. Ornithology, iv. 76. (Constable's ed.)

food, it does nothing but eat, and repose for digestion. If hunger induces it to move, its step is awkward, and its jumps so clumsy as to be disagreeable to the eye. Its song consists only of weak and uncertain whistling, a little resembling that of the Thrush, but not so loud. While singing it moves the crest, but hardly moves the throat. If this warbling is somewhat unmusical, it has the merit of continuing throughout every season of the year. When angry, which happens sometimes near the common feeding-trough, it knocks very violently with its beak. It is readily tamed." The same writer remarks that the two kinds of univeral paste appear delicacies to it; and that it is satisfied even with bran steeped in water. It swallows every thing voraciously, and refuses nothing eatable, such as potatoes, cabbage, salad, fruit of all kinds, and especially white bread.

The Chatterer is easily taken by means of nooses, to which mellow berries are attached. It is not deterred from rushing into nets and springes, even by the sight of its companions entrapped and hanging in the nooses, uttering cries of distress. The flesh is esteemed as delicate and well-flavoured.

Nothing whatever is known of the domestic economy of these birds, either in the Old or the New World. They certainly have never been known to breed in any part of Europe, where indeed they are seen only in winter. Central Asia is supposed to be the scene of their summer residence, and the bringing up of their family. The kindred species of the United States (*A. Carolinensis*, Briss.), however, builds

a large nest in the fork of a cedar or apple tree; composed of stalks of grass, coarse without, and fine within. Here it lays three or four eggs, of a bluish white, marked with dots of black and purple.

Family V. Laniadæ.

(*Shrikes.*)

Among the most interesting phenomena of Zoology are those very numerous cases, in which some strongly marked peculiarities of structure or habit in one group are reproduced in another, widely removed from it in the totality of its organization. An instance of this analogy is now before us. The Shrikes are undoubtedly Passerine birds in their whole structure, yet no one can look upon the beak of one of these birds without being strongly reminded of that of the *Falconidæ*, in its strength, its arched form, its strongly hooked point, and in the distinct tooth which precedes the usual notch of the *Dentirostral* type. And this structure of the beak is accompanied by a carnivorous appetite, a rapacious cruelty, and a courage that are truly Accipitrine, and have induced their association with the birds of prey, both by unscientific and scientific observers. The Shrikes not only devour the larger and more powerful insects, but also pursue, attack, and overcome small birds and quadrupeds, seize them in their beak or claws, and bearing them to some station near, tear them to pieces with their toothed and crooked beak. Mr. Martin mentions having seen a species from

New Holland (*Vanga destructor*, TEMM.), after strangling a mouse, or crushing its skull, double it through the wires of its cage, and with every demonstration of savage triumph proceed to tear it limb from limb, and devour it.* Mr. Swainson, alluding to the rapacity and power of the *Laniadæ*, remarks that the comparisons frequently drawn between them and the *Falconidæ*, are no less true in fact, than beautiful in analogy; for that many of the latter sit on a tree for hours, watching for such little birds as may come within reach of a sudden swoop, when pouncing on the quarry, they seize it in their talons, bear it to their roost, and devour it piecemeal. These, he adds, are precisely the manners of the true Shrike; yet, with all this, the structure of the Falcons and Shrikes, and their more intimate relations are so different, that these birds cannot be classed in the same Order, though they illustrate that system of symbolic relationship termed analogy, which Mr. Swainson believes to pervade creation; yet the two groups are in no wise connected, and there is, in consequence, no *affinity* between them.

In addition to what we have said of the characters which the beak presents in this Family, we may add that the claws, as instruments of capture, are peculiarly fine and sharp in the typical species, and this character pervades, more or less, the whole Family. In general, also, the tail-coverts have a tendency to be puffed out into a soft and loose protuberance on the lower part of the back; in some, however, the shafts of these feathers are stiff and prolonged.

* Pict. Mus. i. 303.

Representatives of the Family are scattered all over the world.

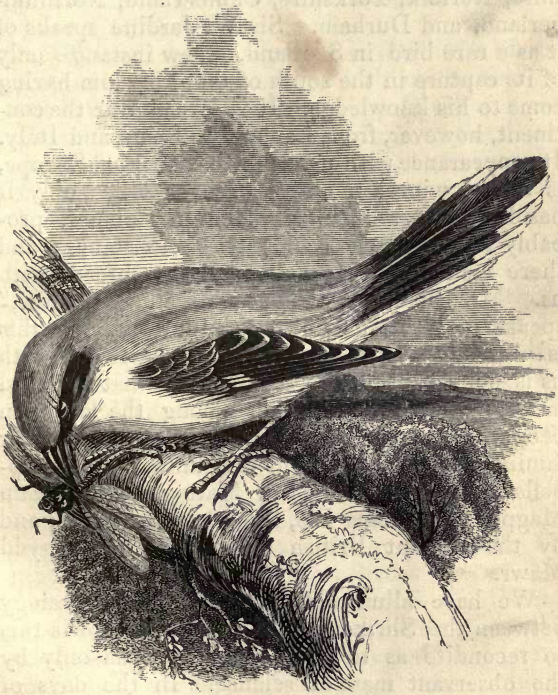
Genus *Lanius*. (Linn.)

The true Shrikes,—which are common to the three continents of the eastern hemisphere, and to North America, but are wanting in the southern division of that continent, as well as in Australia,—are distinguished by the following characters. The beak is rather short, and compressed at the sides, and not depressed as in the Flycatchers; the upper mandible hooked, and furnished with a strong and prominent tooth: the wings have the first three quills graduated, the third and fourth being the longest: the claws sharp, and moderately hooked: the tail usually lengthened. They are birds of much elegance of form, and the hues of the plumage are chaste and pleasing, consisting of various shades of blue-grey, rufous, and white, set off with fine contrasts of black on the head, wings, and tail.

Three species of this genus are known in England, but all as migratory visitors; of these we select as an example, the Great Grey Shrike (*Lanius excubitor*, Linn.), the largest, though not the most common. It is about as large as the Blackbird, but of superior elegance, from the graduated form of its long tail, as well as from the beautiful distribution of its pleasing colours. The whole upper parts are of a clear and pearly grey; the under parts pure white; the wings and tail black, tipped with white; on the former there is also a large patch of white at the base of the

primaries; a band of black passes along each cheek, inclosing the eye.

The Grey Shrike cannot be considered as a regular migratory visitor to these islands, though



GREY SHRIKE.

it has occurred with considerable frequency in most parts, at least of England. Mr. Yarrell observes that it has been obtained in Surrey, Sussex,

Wiltshire, Dorsetshire, Devonshire, Worcestershire, and Cheshire; and in one or two instances, in the north of Ireland. North of London it has been killed in Hertfordshire, Suffolk, Cambridgeshire, Norfolk, Yorkshire, Cumberland, Northumberland, and Durham. Sir W. Jardine speaks of it as a rare bird in Scotland, a few instances only of its capture in the south of that kingdom having come to his knowledge. It is spread over the continent, however, from Lapland to Spain and Italy. Its appearance with us, as in the south of Europe, is in the winter months; once or twice only it has been observed in England in summer, probably through some accidental circumstance; and there is no reason to believe it ever breeds with us. Mr. Rennie, in the "Architecture of Birds," speaks of its nest as common in Kent, but this is probably a mistake. Its winter residence with us is not so infrequent a thing, but that the bird has obtained a recognition among the common people, and numerous local names attest their familiarity with it. Thus it is known by the appellations of Butcher-bird, Mattagass, Mountain Magpie, Murdering Pie, Shreek, and Shrike; and by the ancient British it was named Cigydd Mawr.

We have alluded to the interesting analogy between the Shrikes and the Falcons; nor is this so recondite as to have been remarked only by the observant man of science. In the days of falconry the species before us was actually supposed to be a degenerate sort of hawk, as appears from the curious notices of it in the books of that age. In "The Booke of Falconrie or Hawkinge" (London, 1611), we find "the Sparow-

hawke," immediately succeeded by "the Matagesse;" and at the end of "A generall division of Hawkes and Birdes of Prey, after the opinion of one Francesco Sforzino Vycentino, an Italian gentleman-falconer," there is the following account "Of the Matagasse:"—

"Though the Matagasse bee a Hawke of none Account or Price, neyther with us in any Use; yet neverthelesse, for that in my Division I made Recitall of her Name, according to the French Author, from whence I collected sundries of these Points and Documents appertaining to Falconrie, I think it not beside my purpose briefly to describe herre unto you, though I must needs confesse, that where the Hawke is of so slender Value, the Definition, or rather Description of her Nature and Name, must be thought of no great Regard."

After the description the author goes on to say,—"Her feeding is upon Rattes, Squirrells, and Lisards, and sometime upon certaine Birdes she doth use to prey, whome she doth intrappe and deceive by flight, for this is her Devise. She will stand at pearch upon some Tree or Poste, and there make an exceedyng lamentable Crye and Exclamation, such as Birdes are wonte to doe being wronged, or in Hazard of Mischiefe, and all to make other Fowles believe and think that she is very much distressed, and standes needefull of Ayde, whereupon the credulous sellie Birdes do flocke together presently at her Call and Voice, at which Time, if any happen to approache near her, she out of Hand ceazeth on them, and devoureth them (ungratefull, subtill Fowle!) in Requitall of their Simplicity and

Paines. These Hawkes are in no Accompt with us, but poore simple Fellowes and Peasantes sometimes doe make them to the Fiste, and being reclaymed after their unskillfull Manner, do beare them hooded, as Falconers doe their other Kind of Hawkes whome they make to greater Purposes. Heere I ende of this Hawke, because I neyther accompt her worthe the name of a Hawke, in whom there resteth no Valour or Hardiness, ne yet deserving to have any more written of her Propertie and Nature, more than that she was in mine Author specified as a Member of my Division, and there reputed in the Number of long-winged Hawkes. For truely it is not the Propertie of any other Hawke, by such Devise and cowardly Will to come by their Prey, but they love to winne it by main Force of Winges at random, as the round-winged Hawkes doe, or by free stooping, as the Hawkes of the Tower doe most commonly use, as the Falcon, Gerfalcon, Sacre, Merlyn, and such like, which doe lie upon their wing, roving in the Ayre, and ruffe the Fowle, or kill it at the encounter."

Notwithstanding the slighting tone in which this author treats the attempts of the "poore fellowes" to reclaim this bird, Willughby affirms that it received a more refined and scientific consideration. "Although," says he, "it doth most commonly feed upon insects, yet doth it often set upon and kill not only small birds, as finches, wrens, &c., but (which Turner affirms himself to have seen) even Thrushes themselves: whence *it is wont by our falconers* to be reclaimed and made for to fly small birds."

But upon the Continent the Shrike appears to

have rendered a more important service to the falconer, than the capture of small birds, even the capture of the higher kinds of Falcons themselves. Sir John Sebright informs us that the Peregrine Falcon is taken by placing in a favourable situation a small bow-net, so arranged as to be drawn over quickly by a long string that is attached to it. A pigeon of a light colour is tied on the ground as a bait, and the falconer is concealed, at a convenient distance, in a hut made of turf, to which the string reaches. The *Lanius excubitor*, that is, the Warder Butcher-bird,* from the look-out that he keeps for the Falcon, is tied on the ground near the hut; and two pieces of turf are so set up as to serve him, as well for a place of shelter from the weather, as of retreat from the Falcon. The falconer employs himself in some sedentary occupation, relying upon the vigilance of the Butcher-bird to warn him of the approach of a Hawk. This he never fails to do, by screaming loudly when he perceives his enemy at a distance, and by running under the turf when the Hawk draws near. The falconer is thus prepared to pull the net, the moment that the Falcon has pounced upon the pigeon.†

The Grey Shrike delights more in parks and cultivated fields, where hedge-rows and clumps of trees abound, than in deep forests, or a very open country. The small birds and quadrupeds, or large insects on which it feeds, are taken by open violence, deprived of life, and then impaled upon some thorn or sharp twig, to be more readily devoured. This habit of hanging up his meat,

* Lanius (*Lat.*), a butcher; excubitor, a watchman.

† Observations upon Hawking.

butcher-like, has given him both scientific and vulgar appellations. Mr. Selby says: "I had the gratification of witnessing this operation of the Shrike upon a Hedge-sparrow (*Accentor modularis*) which it had just killed, and the skin of which, still attached to the thorn, is now in my possession. In this instance, after killing the bird, it hovered with the prey in its bill, a short time, over the hedge, apparently occupied in selecting a thorn fit for its purpose. Upon disturbing it, and advancing to the spot, I found the Accentor firmly fixed by the tendons of the wing to the selected twig." * We are informed by Le Vaillant that the same habit marks this bird in the wilds of South Africa; and he observed that the spine or thorn was invariably thrust through the head of the prey, whether insect or bird, which was not devoured at the time of impalement, but allowed to hang until the calls of hunger induced the Shrike to return to its stored provision. And the allied species in North America (*L. borealis*, VIEILL.) resorts to the very same practice, as recorded by Heckewelder, Wilson, and others.

The same singular habits are retained in captivity. Mr. Yarrell has extracted part of a letter from Mr. Doubleday, of Epping, a well-known naturalist, to the effect that an old Grey Shrike had been in his possession twelve months, having been captured near Norwich, in October, 1835. It had become very tame, and would readily take its food from its master's hands. When a bird was given it, it invariably broke the skull, and generally ate the head first. It sometimes held

* Br. Ornith. i. 149.

the bird in its claws, and pulled it to pieces in the manner of the Hawks; but seemed to prefer forcing part of it through the wires, then pulling at it. It always hung what it could not eat up on the sides of the cage. It would often eat three small birds in a day. In the spring it was very noisy, one of its notes a little resembling the cry of the Kestrel.* Bechstein, also, who has added to our knowledge so many particulars of the manners of birds in captivity, states of this species, that if it be captured when it is old, mice, birds, or living insects may be thrown to it, taking care to leave it quite alone, for as long as any one is present it will touch nothing; but soon becomes more familiar, and will eat meat, and even the universal paste. An ounce of meat at least is eaten at a meal, and there should be a forked branch or crossed sticks in the cage, across the angles of which it throws the mouse or any other prey, and then *darting on it behind from the opposite side of the cage*, devours every morsel. Repeated instances have occurred of its voracity inducing it to dart upon small birds hung up in cages.

The imitative power attributed to the Shrike may be not altogether a fiction: different authors ascribe very different notes to it; one resembling the cry of the Kestrel is noted above; Bechstein speaks of its warbling much like the Grey Parrot, the melody interrupted, however, by harsh discordant notes; and a writer in the "Naturalist" compares some strains which he heard it utter to the notes of the Stonechat. But while listening to these, to his surprise, they were discarded, and others adopted of a softer and more melodious

* Brit. Birds, i. 158.

character, never, however, prolonged to anything like a continuous song.

According to Mr. Hewitson, the Shrike builds its nest in thick bushes and high hedges; it is composed of umbelliferous plants, roots, moss, and wool, lined with finer roots and dried grasses. The eggs are from five to seven in number, of a bluish white, spotted and blotched with brown or purplish grey.*

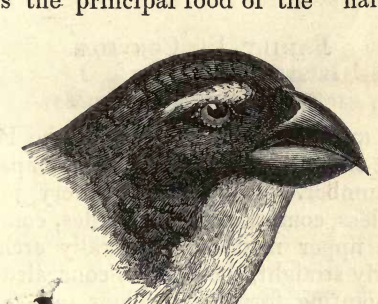
TRIBE IV. CONIROSTRES.

This also is an immense assemblage of species, only less numerous than the last, comprising, like it, birds of much diversity of size, form, structure, and habit. Naturalists consider the *Conirostres* as displaying the highest degree of organization in all their parts collectively, and consequently this Tribe is typical not only in the Passerine Order, but in the whole Class of Birds. The principal character by which they are associated is, that the beak, though varying greatly in shape and comparative size, is yet for the most part short, but thick, and very strong, more or less conical in form, and in general destitute of any notch at the tip. In one extensive tropical group, however, that of the gaily coloured Tanagers of America, the beak, though decidedly of conirostral form, is distinctly notched, and this probably constitutes one link of connexion between this tribe and the preceding. The feet are,

* Hewitson's Oology, cviii.

upon the whole, formed rather for perching than for walking, though many genera walk on the ground habitually.

Seeds and grain of various kinds may be mentioned as the principal food of the "hard billed"



HEAD OF PYRRHULA VIOLACEA.

birds; and for the opening of the different capsules and seed vessels, as well as for the crushing of the often hard seeds themselves, their stout and horny beaks are peculiarly fitted. At the same time not a few add insects to a vegetable diet, and some may be said to be almost omnivorous. In proportion as the form of the beak deviates from that of a short and broad cone, does the appetite vary from an exclusive seed-diet.

So very extensive a tribe we should expect to find represented in all countries of the globe, and so it is. Yet perhaps we may consider it as affecting rather the temperate and colder than the warmer regions of the earth, particularly the very nu-

merous family of Finches, (*Fringilladæ*), which is typical of the whole. The other families are *Corvidæ, Paradiseadæ, Sturnidæ, Colidæ, Musophagadæ, and Bucerotidæ.*

Family I. Corvidæ.

These are among the largest of the Passerine birds, but though widely spread, are comparatively few in number. Their beak is very powerful, more or less compressed at the sides, conical, but long, the upper mandible generally arched, the gape nearly straight, the nostrils concealed by stiff bristles pointing forwards. Their plumage is of dark and unobtrusive colours, often black more or less glossed, and occasionally varied with gray or white. The group denominated Jays, however, form an exception to this sombre coloration, for they are mostly arrayed in the richest azure and purple. These too are more exclusively arboreal than the other *Corvidæ*, which walk a great deal on the ground.

The Crows are birds of firm and compact structure; their wings are long, pointed, and powerful; their feet and claws robust. In disposition they are bold and daring, extremely sagacious, easily tamed and made familiar. Most of them have the faculty of imitating the sounds which they hear, and even the words of human language, with much precision, but their natural voices are loud, harsh, and guttural. They evince a remarkable propensity for thieving, and hiding substances that are of no use whatever to them, particularly if

these display polished surfaces, or brilliant colours. They are omnivorous in their appetite; insects and their larvæ, grain, fruits, bread, flesh, both in a recent state and in putridity, and even small living animals,—all by turns are devoured by these birds with relish.

The species are most abundant in the northern hemisphere; but the great equatorial islands of the Indian Archipelago have some genera peculiar to themselves.

Genus. *Corvus.* (Linn.)

The beak in the typical Crows is large, strong, nearly straight, but the upper mandible more or less arched to the point, which is sometimes very slightly notched; the sides are compressed, and the edges cutting; the nostrils oval, covered with stiff bristles; the wings rather long, pointed, the fourth quill longest; the tail moderate or short, with the extremity even or rounded; the feet formed for walking, the lateral toes strong, and nearly equal; the claws strong, large, and curved.

These are large birds, almost always clothed in black plumage, with the beak and feet of the same colour. They are very voracious, frequently associating in large flocks, which, as their appetite is almost universal, often commit much havoc upon the fruits of human industry.

The largest and most powerful species of the genus is the well-known Raven (*Corvus corax*, Linn.), celebrated even from the time of the universal Deluge. It is upwards of two feet in length, and four in expanse of wing. Its plumage is of a deep glossy black, with steel-blue reflec-

tions. Its watchful cunning, sagacity, and thievishness are well known. It is remarkable that the individuals of the species which inhabit the wildest and most remote regions of North America, far

RAVEN.

from the abodes of civilized man, should display the same propensity for stealing and carrying off pieces of metal and other shining bodies, totally useless to it,—as in Europe. Mr. Kendall, when crossing the elevated lands that divide the waters that fall into Hudson's Bay from those that empty themselves into the Polar Sea, observed a Raven flying with something in its claws, pursued by a number of clamorous companions. On firing, the bird dropped the contested treasure, which proved to be *the lock of a chest*.

The habits of the Raven in a state of nature, are so graphically described in a paper in the "Zoologist," for 1843, that we shall extract it almost entire. "The Raven, or as we call him in Scotland, the 'Corbie,' is a bold, hardy, and strong-pinioned fowl. He is said to be black, and so he appears at a distance, but when inspected more nearly, his feathers are found to be of a glossy blue. The strength and structure of his beak and talons indicate his carnivorous nature; and we find in the days of falconry he was trained to that sport: but he does not seem to have recourse to rapine and murder unless irritated, or hard pressed by hunger, for he prefers carrion just entering on a putrid state to a victim recently slain. He is known throughout the Old Continent from the Arctic Seas to the Cape of Good Hope, and in America, from Hudson's Bay to Mexico.* He is seen in the remotest isles of the Polar Seas, and within the Torrid zone; and is the only fowl whose character remains unchanged by the extremes of heat and cold. He constantly traverses the mountain-regions; and breathing a pure atmosphere, he lives to a great age, and is able to make the most laborious flights from one country to another.

"The Corbie is well known to the shepherd on all the hilly tracts of Scotland. His common cry is *croak*, but when in a state of excitement he utters another sound, which if I could manage to express it by letters, I should spell thus—*whii-ur:* this is repeated with great rapidity, a strong accent being laid on the two *i*-s, and the *ur*, or last syl-

* The Prince of Canino, however, and some other ornithologists distinguish the American Raven as the *Corvus catototl*, WAGL.

lable, seeming to proceed from a collapsing of the throat after its distension in pronouncing the first. With this cry he very frequently intermixes an other, something like *clung*, uttered very much as by a human voice, only a little wilder in the sound. The Ravens are excited to these cries when the shepherd or his dog seems likely to discover a carcase on which they have been rioting and feasting.

"In Ravens the senses of sight and smell are remarkably acute and powerful. Perched usually on some tall cliff that commands a wide survey, these faculties are in constant and rapid exercise, and all the movements of the bird are regulated in accordance with the information thus procured. The smell of death is so grateful to them that they utter a loud croak of satisfaction instantly on perceiving it. In passing over sheep, if a tainted smell is perceptible, they cry vehemently. From this propensity in the Raven to announce his satisfaction in the smell of death, has probably arisen the common notion that he is aware of its approach among the human race, and foretells it by his croakings. I have no doubt the idea is founded in truth, although I think the coming event is not communicated to the Raven by an immediate or supernatural impulse, but that in passing over a human habitation from which a sickly or cadaverous smell may escape, it is perfectly natural for him to announce his perception of it by his cries.

"The Raven lives at perpetual variance with all the other feathered tribes. Even those species which are far his superiors he annoys incessantly with his attacks, especially when loaded with

food, carrying it either to their young or to a spot where they can devour it without interruption. I once saw a Goshawk carrying what I supposed to be a Grouse; this was evidently dead, and sticking out behind the bird, gave it a very curious appearance. Three or four Corbies were high in the air, making from every quarter repeated attacks on the Goshawk, and endeavouring to rob him of his prey. At length one of them was just striking the noble bird, when, relaxing his hold, the dead creature, whatever it might be, fell straight for the earth. The Hawk dived after it with a rapidity perfectly astonishing, and, I think, before it had descended thirty fathoms, struck his talons into it, and bore it safely away from among his angry assailants.

"Nor is this enmity with the Corbie confined to the feathered tribes: sundry of our quadrupeds live in constant warfare with the ill-conditioned fowl. If you see a Corbie hovering and screaming over a linn or athwart the face of a rock, you may be sure that some animal has attracted his attention. Perhaps a fox is basking on a sunny slope; or the wild cat, cautiously seeking a safe footing whence to spring on some unwary bird that has its nest among the cliffs; or perhaps the supple weasel, sporting about, or examining every cranny to find a safe retreat: I have seen the Corbie vexing each of these. The fox will sometimes stretch up his neck and snap at his assailant, when he has made a sudden dive, but the bird eludes the danger, and continues his persecution as before.

"The Corbie, thus feared by some creatures, hated by others, and most especially detested by

the shepherd, on account of certain bloody designs against his fleecy charge, whenever driven by hunger to the attack, makes his nest in the deepest retirement, in solitude the most inaccessible. He selects a leafless, sapless branch of some stunted tree, a mountain-birch or service, jutting out from the face of a perpendicular rock, and hanging over an abyss hundreds of fathoms deep, the bottom often beset with sharp and pointed rocks. It makes one shudder to think of a living creature being precipitated from the top; yet here the female Corbie sits secure, and far more fearless, in far less agitation of spirits, than if her nest were placed in a flowery meadow. The nest is constructed of the decayed stems of heather, skilfully and carefully wattled together with twigs of other trees. A layer of moss is next supplied to fill the interstices, and thus render the mass more compact; this layer is thickest at the bottom, and in places, where the outwork of heather has been made too slight, the inside is partially lined with sprigs of the fly-bent, but principally with wool. Here are deposited the eggs, and here the callow brood are fed and nourished, and kept dry and warm. The eggs are five, six, or seven in number, of a bluish colour, blotched with irregular spots of brown. The order in which they are deposited is scarcely ever seen, for it rarely happens that a human being can approach sufficiently near for that purpose. The young Corbies, however, are seldom permitted to escape; for the shepherd, seeking the spot, perilous though it be, smashes the eggs with stones hurled from above, and batters the nest to pieces. He sometimes postpones his re-

venge until the young ones, full grown and fat, are peeping over the brink of the nest, and almost ready to abandon it altogether. He would always delay his attack till this period, but as the young advance in age and size, the more extensively and recklessly do their parents cater for their support.

"When Ravens set out on a long journey they always travel in pairs, and so high in the air, that were it not for their frequent crying, they would escape notice altogether. So great is the height at which they fly, that no cliff or peak, however lofty, can cause them to swerve from the direct course on which they are bent."*

In the southern parts of Britain, where precipitous rocks are uncommon, the Raven usually selects as its breeding-place some lofty tree, using the same for successive years. White, in his charming "Natural History of Selborne," has mentioned such an one, and recorded the tragical fate of its possessor. "In the centre of this grove," says he, "there stood an oak, which, though shapely and tall on the whole, bulged out into a large excrescence about the middle of the stem. On this a pair of Ravens had fixed their residence for such a series of years, that the oak was distinguished by the title of the Raven-tree. Many were the attempts of the neighbouring youths to get at this eyry; the difficulty whetted their inclinations, and each was ambitious of surmounting the arduous task. But when they arrived at the swelling, it jutted out so in their way, and was so far beyond their grasp, that the most daring lads were awed, and acknowledged the undertaking to be too hazard-

* Zoologist, i. 215.

ous. So the Ravens built on, nest upon nest, in perfect security, till the fatal day arrived in which the wood was to be levelled. It was in the month of February, when those birds usually sit. The saw was applied to the butt, the wedges were inserted in the opening, the wood echoed to the heavy blows of the beetle or mallet, the tree nodded to its fall; but still the dam sat on. At last, when it gave way, the bird was flung from her nest; and though parental affection deserved a better fate, was whipped down by the twigs, which brought her dead to the ground." *

Family II. Paradiseadæ.

(*Birds of Paradise.*)

The Family which we come now to describe, though very limited in extent, contains the most singular and the most magnificent of the feathered tribes. Natives of the remote island of New Guinea, to which they are almost confined, for a long time they were known to Europe only by the mutilated skins which from time to time found their way hither, among the rarities of Indian commerce, and by the strange and extravagant fables with which tradition had embellished their history. Natural history with our forefathers was very largely fabulous, but with no animals had fiction been more busy than with these Birds of Paradise. "From one fabulist to another came the tradition (losing nothing, as is usual with traditions, in its descent), that these 'gay creatures of the element' passed their whole existence in

* White's Selborne, Letter I. First series.

sailing in the air, where all the functions of life were carried on, even to the production of their eggs and young. The dew and the vapours were said to be their only food, nor were they ever supposed to touch the earth till the moment of their death, never taking rest except by suspending themselves from the branches of trees by the shafts of the two elongated feathers which form a characteristic of this beautiful race. The various names applied to them kept up the delusion that originated in the craft of the inhabitants of the eastern countries where they are found; for the natives scarcely ever produced a skin in former times from which they had not carefully extirpated the feet. Nor was it only the extreme elegance and richness of their feathers that caused these birds to be sought as the plume for the turbans of oriental chiefs; for he who wore that plume, relying implicitly on the romantic accounts of the life and habits of the bird, and impressed with its sacred names, believed that he bore a charmed life, and that he should be invulnerable even where the fight raged most furiously." *

The sober accounts of honest travellers, as Pigafetta, Bontius, and others, who described the birds from their own observation as having feet, and as feeding on small birds and large insects,—were rejected with contempt by closet naturalists, and they themselves were accused, in no measured terms, of falsehood. Even after specimens had been brought to Holland, with their feet attached, and after the enumeration in the published Catalogue of Tradescant's Museum in England, of "Birds of Paradise, or Manucodiata, whereof

* Penny Cyclop. iv. 419.

divers sorts, *some with*, some without legs," Jonston, in Holland, could still write oracularly. "It is peculiar to them all to be without feet; although Aristotle asserts that no bird is without feet, and Pigafetta assigns to them feet a hand-breadth in length." So difficult is the eradication of a favourite fable!

In their general structure, the Birds of Paradise have a considerable resemblance to the Crows, which they approach also in size; the skins which are brought to Europe being evidently much contracted by the great heat employed in drying them. They have the beak long, strong, with the upper outline curved, and the sides compressed to the tip, which is notched; the base of the upper mandible is concealed by short feathers, which also cover the nostrils. The wings are long and rounded; the tail varying in length, even at the extremity, or else rounded. The feet (*tarsi*) are robust, long, and covered by a single lengthened scale; the toes long and strong, especially the hind-toe; the claws long, strong, and curved. The sides of the body, the neck, the breast, the tail, and sometimes the head are ornamented with lengthened and peculiarly developed showy feathers; the plumage of the face and throat is commonly of a scaly or velvety texture, and most richly glossed with metallic reflections, and other parts of the body are frequently arrayed in rich and brilliant hues.

Genus *Samalia*. (Vieill.)

The species of the Birds of Paradise, though not exceeding seven in number, yet present so

much diversity as to be divided into several genera. Of these the genus *Samalia*, which contains the species best known, is thus characterized.

BIRDS OF PARADISE.

(*Samalia apoda et Lophorina superba.*)

The beak is robust, convex above, furnished at the base with velvet feathers, straight, compressed at the sides, and jagged towards the tip. The sides of the belly and the flanks are adorned with

very long, flexible, decomposed feathers; or else the back of the neck is furnished with elevated plumes, stiff, and of moderate length.

The Great Emerald (*Samalia apoda*, Linn.), represented in the upper figure of the above engraving, is about as large as a pigeon; the body generally is of a fine maronne brown, the forehead clothed with close-set feathers of a velvety black, shot with emerald-green; the top of the head and upper part of the neck are brilliant yellow; the upper part of the throat golden-green; the front of the neck violet-brown; the flanks are adorned with bundles of very long plumes, with loose beards of a yellowish hue; these extend far beyond the tail-feathers; two long horny and downy shafts, set with stiff hairs, terminating in a point, proceed from the sides of the rump, and sweeping in a circular direction extend to the length of two feet. This is the description of the male; the female is destitute of the long floating plumes, and her coat, though still richly coloured, is less lustrous than that of her consort.

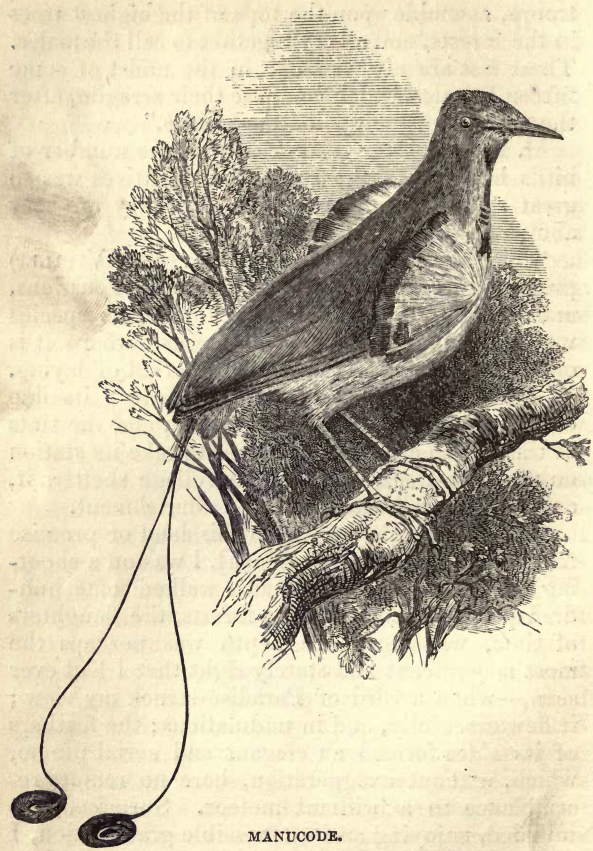
Our knowledge of these beautiful birds in a state of nature is almost entirely due to the observations of M. Lesson, who, though he laments the shortness of his stay at New Guinea, which lasted but thirteen days, appears to have made good use of his time. "The Birds of Paradise," remarks this naturalist, "or, at least, the Emerald (*S. apoda*) the only species concerning which we possess authentic intelligence, live in troops in the vast forests of the country of the Papuans, a group of islands situated under the equator. . . . They are birds of passage, changing their quarters according to the monsoons. The females congregate in

troops, assemble upon the tops of the highest trees in the forests, and all cry together to call the males. These last are always alone in the midst of some fifteen females, which compose their seraglio, after the manner of the gallinaceous birds."

M. Lesson, after remarking that the number of birds brought to the ship by the natives was so great as to make it probable that they are very abundant, proceeds thus:—

"The Manucode (*Cincinnurus regius*, VIEILL.) presented itself twice in our shooting excursions, and we killed the male and female. This species would seem to be monogamous, or perhaps it is only separated into pairs at the period of laying. In the woods this bird has no brilliancy; its fine coloured plumage is not discovered, and the tints of the female are dull. It loves to take its station on the teak-trees, whose ample foliage shelters it, and whose small fruit forms its nourishment.

"Soon after my arrival in this land of promise for the naturalist [New Guinea], I was on a shooting excursion. Scarcely had I walked some hundred paces in those ancient forests, the daughters of time, whose sombre depth was perhaps the most magnificent and stately sight that I had ever seen,—when a Bird of Paradise struck my view; it flew gracefully, and in undulations; the feathers of its sides formed an elegant and aerial plume, which, without exaggeration, bore no remote resemblance to a brilliant meteor. Surprised, astounded, enjoying an inexpressible gratification, I devoured this splendid bird with my eyes; but my emotion was so great that I forgot to shoot at it, and did not recollect that I had a gun in my hand till it was far away.



MANUCODE.

" One can scarcely have a just idea of the Paradise-birds from the skins which the Papuans sell to the Malays, and which come to us in

Europe. These people formerly hunted the birds to decorate the turbans of their chiefs. They call them *mambéfore* in their language, and kill them during the night by climbing the trees where they perch, and shooting them with arrows made for the purpose, and very short, which they make with the stem of the leaves of a palm. . . . All the art of the inhabitants is directed to taking off the feet, skinning, thrusting a little stick through the body, and drying it in the smoke. Some, more adroit, at the solicitation of the Chinese merchants, dry them with the feet on. The price of a Bird of Paradise among the Papuans of the coast, is a piastre at least. We killed, during our stay at New Guinea, a score of these birds, which I prepared, for the most part.

"The Emerald, when alive, is of the size of a common Jay; its beak and its feet are bluish; the irides are of a brilliant yellow; its motions are lively and agile; and, in general, it never perches except upon the summit of the most lofty trees. When it descends, it is for the purpose of eating the fruits of the lesser trees, or when the sun in full power compels it to seek the shade. It has a fancy for certain trees, and makes the neighbourhood re-echo with its piercing voice. The cry became fatal, because it indicated to us the movements of the bird. We were on the watch for it, and it was thus that we came to kill these birds; for when a male Bird of Paradise has perched, and hears a rustling in the silence of the forest, he is silent, and does not move. His call is *voike, voike, voike, voiko,* strongly articulated. The cry of the female is the same, but she raises it much more feebly. The latter, deprived of the bril-

liant plumage of the male, is clad in sombre attire. We met with them, assembled in scores, on every tree, while the males, always solitary, appeared but rarely.

"It is at the rising and setting of the sun that the Bird of Paradise goes to seek its food. In the middle of the day it remains hidden under the ample foliage of the teak-tree, and comes not forth. He seems to dread the scorching heat of the sun, and to be unwilling to expose himself to the attacks of a rival. . . . .

"In order to shoot Birds of Paradise, travellers, who visit New Guinea, should remember that it is necessary to leave the ship early in the morning, to arrive at the foot of a teak-tree or fig-tree, which these birds frequent for the sake of their fruit, before half-past four, and to remain motionless till some of the males, urged by hunger, light upon the branches within range. It is indispensably requisite to have a gun which will carry very far with effect, and that the grains of shot should be large; for it is very difficult to kill an Emerald outright; and if he be only wounded, it is very seldom that he is not lost in thickets so dense that there is no finding the way without a compass." *

In Mr. Bennett's "Wanderings in New South Wales," &c., there are many interesting details of an individual of this beautiful species, which he saw in captivity in Mr. Beale's aviary at Macao; both this specimen, and a pair which M. Lesson saw caged at Amboyna, were fed with boiled rice, and such large insects as grasshoppers and cock-roaches.

* Voyage de la Coquille.

Family III. Sturnidæ.

(*Starlings.*)

The extensive and widely distributed Family before us, comprises species, for the most part, above the average size of Passerine birds, but yet inferior to the Crows. They are in general social, associating in flocks, often immensely numerous; feeding much on the ground, and spreading destruction among the cultivated fields, or following herds of cattle for the sake of the parasitical insects which infest their bodies, or such as they disturb from the grass on which they graze. Hence their legs and feet are robust and powerful, and their gait stately, and frequently swaggering, like that of the *Corvidæ*. Their beak is nearly straight, stout at the base, diminishing regularly to a sharp point, which is not distinctly notched; the ridge ascends upon the forehead, dividing the plumage of that part. The texture of this organ is particularly hard and firm, and its form is well adapted to the penetration of the earth in search of worms and subterranean larvæ.

The plumage of the Starlings, though commonly of dark colours, has a peculiar richness; black, glossed with lustrous reflections of steel-blue, purple, or green, is the prevailing hue. Occasionally, however, this is relieved by brighter tints, as broad masses of crimson or yellow, and, in a few instances, of white; as in the genera *Icterus*, *Xanthornis*, and others. The numerous species are scattered over every part of the world.

Genus *Sturnus*. (Linn.)

The beak in the Starlings proper is almost straight, pointed, depressed from the base, rather wider than high; the ridge convex and rounded, the point almost imperceptibly notched. The nostrils are basal, and lateral, partially closed by a prominent membrane. The wings are lengthened and pointed; the first feather so short as to be rudimentary, the second the longest; the tail short, somewhat forked. The feet are of moderate size, formed for walking; the lateral toes equal in length, and united to the middle one as far as the first joint.

We have but one British representative of this genus, the common Starling, or Stare (*Sturnus vulgaris*, Linn.), but this is abundant in most parts of the kingdom. It is a beautiful bird, both in its form, and in the colours of its plumage, which, combining with its sprightly manners, its intelligence, docility, memory, and power of imitating various sounds, have made it a general favourite. The general hue of the plumage is almost black, glossed with brilliant purple and green reflections in the changing lights; the feathers are tipped with triangular points of yellowish-white, which gives an agreeable character of star-like dotting to the whole; in the course of the winter, many of these points fall off, particularly on the under parts, when the plumage is more uniform in hue. The beak is brilliant yellow.

"The Starling," observes Bechstein, "becomes wonderfully familiar in the house; as docile and cunning as a dog, he is always gay, wakeful, soon

knows all the inhabitants of the house, remarks their motions and air, and adapts himself to their humours. In his solemn tottering step, he appears to go stupidly forward; but nothing escapes

STARLING.

his eye. He learns to pronounce words without having his tongue cut, which proves the uselessness of this cruel operation. He repeats correctly the airs which are taught him, as does also the female, imitates the cries of men and animals, and the songs of all the birds in the room with

him. It must be owned that his acquirements are very uncertain; he forgets as fast as he learns, or he mixes up the old and new in utter confusion. . . . Not only are the young susceptible of these instructions, the oldest even shew the most astonishing docility." *

In our own country the Starling appears to be partially migratory; large numbers, that during the summer were spread over the kingdom, accumulating in winter in the most southern counties, as Devonshire and Cornwall; returning thence as soon as the frosty weather has broken up. Some, however, even in the north, content themselves with a removal to the sea side, where, even in the hardest weather, they can find subsistence in the marine worms and polypes, in obtaining which they display much ingenuity. Insinuating its sharp pointed beak under the rounded pebbles of the beach, the Starling skilfully turns them over with a sudden jerk, and immediately seizes and devours whatever may have been sheltered beneath.

At the breeding season these birds frequent old ruined buildings, church-steeples, or even inhabited houses, hollow and decayed trees in lonely woods, or rocky cliffs overhanging the sea. But at other times they resort to low, marshy grounds, covered with reeds or beds of osiers, among which they roost nightly in incredible numbers. About an hour before dark all the hosts that have been feeding in the vicinity congregate into one vast phalanx, which, before they retire to rest, perform the most complex and beautiful evolutions, wheeling and sweeping in the air, separating and uniting, forming the most regular and varied

* Cage-birds (Lond. 1838), p. 187.

figures, as if animated by a common impulse, or obeying a definite word of command. They will form themselves into a triangular body, so compact as not to permit the sky to be seen between them, then shoot into a long pear-shaped figure, expand like a sheet, wheel into a ball, as Pliny long ago observed, each individual apparently striving to get into the centre, with a promptitude more like that of an army under review than the actions of birds. At length, after many feints to alight and resumptions of the aerial manœuvres, the whole army descends upon the reeds with much clamour, which is kept up for some time after they have taken their places for the night.

Of these peculiarities in the economy of this bird, Mr. Yarrell has furnished some interesting illustrations. "I am indebted," observes this eminent zoologist, "to the kindness of the late Dr. Goodenough, Dean of Wells, for the following account of an extraordinary haunt of Starlings on the estate of W. Miles, Esq., at King's Weston:—'This locality is an evergreen plantation of arbutus, laurustinus, &c., covering some acres, to which these birds repair in an evening—I was going to say, and I believe I might with truth say—*by millions*, from the low grounds about the Severn, where their noise and stench are something altogether unusual. By packing in such myriads upon the evergreens, they have stripped them of their leaves, except just at the tops, and have driven the Pheasants, for whom the plantation was intended, quite away from the ground. In the daytime, when the birds are not there, the stench is still excessive. Mr. Miles was about to cut the whole plantation down to get rid of them, two

years ago, but I begged him not to do so, on account of the curiosity of the scene, and he has since been well pleased that he abstained.'

"Another instance of a similar character was communicated to me in March last (1845), by Robert Ball, Esq., of Dublin. 'In the mass of thorn-trees at the upper end of the Zoological Garden in the Phœnix Park, sleep every night, from the end of October to about the end of March, from 150,000 to 200,000 Starlings. This enormous number may appear an exaggeration, yet it is the estimate of many observations. When these Starlings were first observed, they were estimated at from 15,000 to 20,000; but during three years they seem to have increased tenfold.'"*

The simple nest of the Starling is composed of twigs, slender roots, dry leaves, grass, straw, and feathers. Like the Swallows, it often returns to the same nest year after year only taking care to clean it out. It lays, twice in the year, from four to seven eggs, of a delicate pale blue or ashy green hue, which are hatched in about sixteen days. In some parts of Germany, the peasants breed Starlings like domestic pigeons; they eat the young, which they take before they are fully fledged; thus they obtain three broods, the last of which, however, they do not molest, both in order not to discourage the parent birds, and also not to diminish this branch of economy.†

A communication to the pages of the "Zoologist," from Dr. Morris of York, contains some interesting particulars of these birds' nest-building. "I stood this morning," observes the Doctor,

* Brit. Birds, ii. 43. † Bechstein.

"for nearly an hour, watching a pair of Starlings. They had chosen a hole in a tree close to me for their nest, in the construction of which the female alone was engaged: the male sate near, looking on, but never fetching any materials; he seemed to be a sort of guard or sentinel, as he repeatedly drove off some sparrows that were too inquisitive as to the progress the nest was making. The female, in her arduous task, made on an average, by my watch, three trips per minute, with small twigs and bits of dry grass, which she picked up near the tree. Sometimes she took three or four small ones at one time, so that at this rate, supposing her to work for only six hours, she would have brought together upwards of a thousand sticks, &c., which would be more than sufficient to form her nest."

Mr. Jesse, noticing the difference of character among birds, describes that of the Starling in the following terms:—"There is a great variety of character amongst birds; some appear moping and melancholy, and others full of joy and hilarity. One variety of bird (the Titmouse) is always restless and on the move, while another, the Heron, for instance, is grave and thoughtful in its habits, and slow and methodical in its movements. The bird, however, which amuses me most, is the Starling. There is an oddity in all he does; he appears curious and observant; in short, a sort of Paul Pry amongst his species. He has a great deal of sociability and amusing fun in his disposition, accompanied by great restlessness, and yet apparent good fellowship and good humour. The Jackdaw comes next to him in these respects; but I know of no bird whose character is more

strongly marked than that of the Starling. He is easily tamed, and when in a state of confinement his good spirits do not forsake him, and he appears to reconcile himself to his situation with great philosophy."*

Family IV. Fringilladæ.

(*Finches.*)

This Family, consisting of birds which may all be considered small, is one of immense extent. They are remarkable for the shortness, thickness, and powerful structure of the beak; the upper and lower mandibles are for the most part equally thick, their height and breadth are nearly alike, so that when the beak is closed, it commonly presents the appearance of a very short cone, divided in the middle by the gape. In some genera, however, the conical form is less obvious, by the bulging or swelling of its outline, both vertically and laterally. In many of the Finches, as the Hawfinch of our own country (*Coccothraustes*), the Java Sparrow (*Amadina*) so often seen in cages, and others, the thickness of the beak in proportion to its length, and in comparison with the size of the head, is enormous, but in a rare and extraordinary bird from West Africa (*Loxia ostrina*, Vieill.), the beak is but little inferior in size to the whole head.

The great strength thus communicated to the beak, well adapts it for the functions it is ordained to perform, for the food of these birds consists very largely of seeds, often inclosed in

* Gleanings, 177.

woody capsules of great hardness, or the kernels of stone-fruits, which must either be opened by a forcible wrench, or crushed by strong pressure. At the season of incubation, many species live extensively on caterpillars, and the larvæ of other insects, with which the young are almost exclusively fed; and there are some numerous genera, in which a fruit or seed diet is at all times largely varied by insects. In such cases, as the Tanagers for example, the upper mandible is more or less obviously notched at the tip, as in the slender-billed *Dentirostres;* and, for the same purpose, the more secure holding of a living and active prey.

The Finches are spread over the whole world, as might be supposed of so very extensive a Family; in general, the individuals of each species are abundant, and many associate in flocks. They are considered to possess the peculiarities of the Class in very high development; they are in general much admired for their clean neat appearance, their often brilliant colours, their docility of manners, and their sprightliness; and these qualities, united with their small size, the facility of supplying them with food, and the power of song with which very many species are endowed, render them the most suitable of all birds for the confinement of a cage;—hence they are general favourites in the houses of the rich and the poor.

Genus *Carduelis.* (Briss.)

We have, in the Goldfinches, an example of the *Fringilladæ* with the beak of only moderate thickness, or which might even be characterized

as slender, but of very regularly conic form. It is rather lengthened, compressed, and drawn to a sharp point, the edges slightly curved; the nostrils are placed on each side of the base, covered by small feathers. The wings are long and pointed; the first, second, and third quills nearly equal, and longest. The tail is of moderate length, and forked. The legs and feet are somewhat short; the lateral toes equal; the claws curved, slender, and acute.

With the exception of the Canary, there is no cage-bird which is so universal a favourite as the pretty common Goldfinch (*Carduelis elegans*, STEPH.), and none more deservedly so. The cleanness and smoothness of its chastely-coloured body-plumage, its crimson head, admirably set off with white and velvet-black, its tail and wings of black, tipped with white, and the broad band of rich golden yellow, which crosses the latter, render it one of the most beautiful of British birds. It is characterized, moreover, by an extreme docility. It may be readily taught to draw its own food and water from reservoirs, by means of a little bucket attached to a cord; and actions much more wonderful than this, individuals have been trained to perform. Exhibitions are by no means rare, in the metropolis, of Finches of this and other species, brought to perform many amusing tricks, and to go through complicated and difficult manœuvres with precision at the word of command, and even to stand discharges of gunpowder without manifesting any signs of fear. The Sieur Roman, who some years ago exhibited Goldfinches, Linnets, and Canaries in this country, had brought them to a surprising pitch of obe-

dient docility. One would feign to be dead, and suffer itself to be held up by the tail or claw, without exhibiting any signs of life; another would stand on its head, elevating its tail and feet in the air; a third would imitate a Dutch milkmaid

GOLDFINCH.

going to market with her pails on her shoulders; a fourth mimicked a Venetian girl looking out at a window; a fifth represented a soldier, mounting guard as a sentinel; a sixth was a cannonier, with a cap on its head, a firelock on its shoulder, and a match in its claws, with which it discharged a little cannon. This bird also pretended to be wounded, and was wheeled in a barrow to the hospital, after which, to shew that its misfortune was only feigned, it flew away before the com-

pany. A seventh turned a sort of windmill; and an eighth stood in the midst of some fireworks which were discharged all round it, without exhibiting the least symptoms of terror.*

The attachment which the Goldfinch often displays towards its master or mistress, is another pleasing trait in its character. Instances of its recognition of persons, with confiding familiarity towards them, are sufficiently common. The following example is given by the translator of the English edition of Bechstein's Cage-Birds:—"Madame —— had a Goldfinch that never saw her go out without making every effort in his power to quit his cage and follow her, and welcomed her return with every mark of extreme delight; as soon as she approached, a thousand little actions shewed his pleasure and satisfaction; if she presented her finger, he caressed it a long time, uttering a low joyous murmur. This attachment was so exclusive, that if his mistress, to prove it, substituted another person's finger for her own, he would peck it sharply, while one of his mistress's placed between two of this person's, would be immediately distinguished and caressed accordingly."

The song of the Goldfinch is cheerful and pleasing, though it lacks the depth of tone, and rich variety of modulation, which marks that of some of the Thrushes and Warblers. "It is a mixture of tones and harmonies," says Bechstein, "more or less dwelt upon, and the oftener the sound *fink* is introduced, the more it is admired amongst us. There are some Goldfinches that utter it only once or twice in their strains, while

* Syme's Brit. Song-birds.

others will repeat it four or five times following." It has the advantage, also, of being continued in confinement during the greater part of the year, being interrupted only during the period of moulting.

In a wild state this beautiful and pleasant little bird is found in all parts of Europe; it is spread commonly, though not abundantly, over the British Islands, decreasing, however, towards the northern parts. It flits hither and thither in small flocks, frequenting, in spring, gardens and orchards. In the autumn and winter, the flocks are somewhat more numerous, being reinforced by the birds of the season, and they now seek waste places occupied by *syngenesious* plants, or such as have their seeds often furnished with down, arranged on a sort of head or broad cushion. The common thistles are great favourites with this bird; and hence both its scientific appellation of *Carduelis* (*carduus*, a thistle, *Lat.*), and its German name of Distelfink, or Thistle-finch. The groundsel, also, which ripens its seed throughout the whole year, is eagerly sought by the Goldfinch.

> "I love to hear the Goldfinch twit and twit,
> And see him pick the groundsel's feathered seeds;
> And then in bower of apple-blossom perched,
> Trim his gay suit, and pay us with a song."*

"If watched," observes Mr. Yarrell, "while thus feeding, they may be seen climbing and clinging in all directions about the stems, picking out their favourite portions. If approached too near, the little party, one by one, move off to the next

* Hurdis's Evening Walk.

nearest patch, with undulating flight, twittering as they rise:—

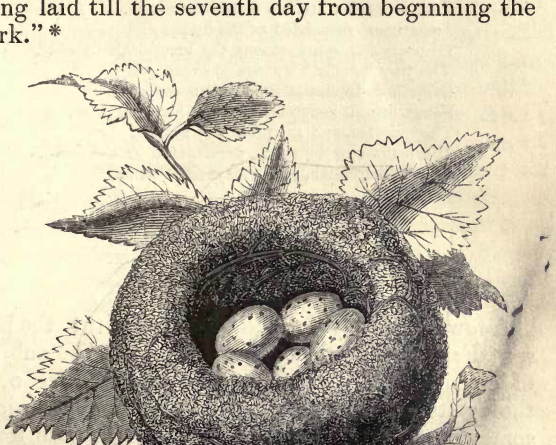
> 'Each outstretched wing
> A fairy fan, with golden sticks adorned,'

and thus roving in small flocks, through the autumn and winter, living almost entirely on various seeds, particularly those of the different species of thistle, they perform good service to the agriculturist by consuming the prolific source of many a noxious weed." *

There is no European bird that equals the Goldfinch in the beauty, compactness, and neatness of its nest. It is often built on a fruit tree in the orchard, on some small and weak branch. The outer part is composed of fine moss, lichen, blades of grass, fine twigs and roots, wool, cotton, worsted, &c., all beautifully felted together, and rounded so that no ragged ends shall project; and lined with down from the catkins of the willow, with feathers and hair, made very smooth. But birds in general will take the materials that they can most readily obtain, provided these can be adapted to their purpose. "On the 10th of May, 1792," remarks Bolton, "I observed a pair of Goldfinches beginning to make their nest in my garden; they had formed the groundwork of moss, grass, &c., as usual, but on my scattering small parcels of wool in different parts of the garden, they in a great measure left off the use of their own stuff, and employed the wool. Afterwards I gave them cotton, on which they rejected the wool, and proceeded with the cotton; the third day I supplied them with fine down, on which they forsook both the other, and finished their

* Brit. Birds, i. 541.

work with this last article. The nest when completed was somewhat larger than is usually made by this bird, but retained the pretty roundness of figure, and neatness of workmanship which is proper to the Goldfinch. The nest was completed in the space of three days, and remained unoccupied for the space of four days, the first egg not being laid till the seventh day from beginning the work." *



NEST OF GOLDFINCH.

The Goldfinch raises but one brood in the season. The eggs are four or five in number; of a pale bluish hue, marked with red spots and freckles, mingled with streaks and dashes of purplish

* Harmonia Ruralis, Pref. vi.

brown, often forming a rude crown around the larger end.

In addition to the poetical allusions to this favourite bird, already quoted, we subjoin the accurate description of its nest by Grahame, the biographer of the birds of Scotland:—

> "The Goldfinch weaves, with willow-down inlaid,
> And cannach-tufts, his wonderful abode.
> Sometimes, suspended at the limber end
> Of plane-tree spray, among the broad-leafed shoots,
> The tiny hammock swings to every gale;
> Sometimes in closest thickets 'tis concealed;
> Sometimes in hedge luxuriant, where the briar,
> The bramble, and the plum-tree branch,
> Warp through the thorn, surmounted by the flowers
> Of climbing vetch, and honeysuckle wild." *

Family V. Coliadæ.

(*Colies.*)

A few singularly-formed birds constitute the present Family, whose relations have been the subject of considerable diversity of opinion among ornithologists. Their beak is short, powerful, conical, somewhat compressed at the sides, the two mandibles being arched, the point of the upper slightly overhanging the lower. The feathers of the tail are much graduated, exceedingly long and rigid; they are but ten in number, thus varying from what is customary among birds, the almost constant number being twelve, and agreeing in this respect with the Swifts; as they do also in another remarkable peculiarity, that the hind toe is capable of being turned forwards, so that all the four toes point in one direction. These coinci-

* Birds of Scotland, 49.

dences in structure with the Swifts, in points almost exclusively peculiar to them,* are the more singular, because these birds do not manifest any affinity, nor even resemblance in their general form, or in their habits.

The Colies are birds confined to Africa and India; they live much in trees, climbing about somewhat in the manner of Parrots; they are social in disposition, living in large flocks, and even breeding in society, constructing numerous nests in the same bushes. It is reported that they sleep suspended from a branch, with their heads downwards, many of them together; and that when the weather is cold, as it sometimes is in South Africa, they are found so benumbed in the morning, that they may be readily taken one after another, without an effort to escape. This curious statement is given by no less accurate an observer than Le Vaillant.

Genus *Colius*. (Gmel.)

As the Family under consideration comprises but this single Genus, its characters may be considered as already given in part; they may, however, be thus summed up. The beak is short, strong, conical, slightly compressed, entire, with the mandibles equal, and the edges arched; the nostrils rounded; the wings short, the third quill longest; the tail greatly lengthened, and diminishing from the centre to the sides, the external feathers being short; the claws arched and long, that of the hind toe shorter than the others.

* The Humming-birds, however, have also but ten tail-feathers; the Poultry-birds have from fourteen to eighteen.

The plumage of these birds is short, dense, and smooth, with a silky appearance; the feathers of the body are furnished with an accessory plume, those on the lower part of the back are very short, those of the head are lengthened, forming a long pointed crest, which can be erected at pleasure. The prevailing colours are sombre, as grey or ashen, from which circumstance, and from that of their crawling about trees, they are denominated at the Cape of Good Hope, *Muys-vögel*, or Mouse-birds.

These birds subsist mainly on fruits, the buds of trees, and the tender sprouts of vegetables; from the mischief which they do in the gardens of the colonists, devouring the shoots of the culinary plants as fast as they appear, they are much disliked. They walk badly on the ground, but are expert climbers, clinging to the branches in all sorts of attitudes. They sail from bush to bush in a long row, one after another, alighting always near the ground, and clambering to the topmost twigs, with the assistance of their beak and long stiff tail, picking off the buds or berries as they ascend; and they do not pass to the next bush till the whole flock is ready, when they again sail along in the same regular succession. Their cry is monotonous, the windpipe (*trachea*) being furnished with only a single pair of vocal muscles; and that of the largest species is said to resemble the bleating of a lamb. Their bodies are much more heavy and massive than would be supposed at first appearance, the plumage lying very flat and close.

The nests of the Colies, which, as already remarked, are placed in groups, are spacious and of a round form; in each of these is deposited

Scansores, with which they are probably connected by the intervention of the Hornbills, the Family which will next come under our notice. Mr. Swainson places them here, immediately before the *Scansores*, intermediate between the Finches and the Hornbills. He remarks that those which shew an affinity to the Bullfinches are small (referring here, we presume, to the Chilian Plant-cutter, *Phytotoma*); while others, whose size and peculiar structure assimilate them more to the Hornbills, are of a size proportionate to those birds; observing that they possess a short, but very strong and thick bill, more or less curved on the top, the cutting margins being minutely serrated like the teeth of a saw. Their food is stated to be entirely vegetable, and that of the most tender and delicate description; and Mr. Swainson remarks that it is singular to observe that the beak in this Family (in outward appearance much stronger than that of the Finches) should yet be employed in procuring the softest vegetable food; while the short beak, posterior nostrils, hopping gait, and purely vegetable food, are all exemplified in such birds as *Buceros galeatus*, and proclaim the affinity of the Plantain-eaters to the Hornbills.

These birds are confined to Africa, where they subsist almost exclusively on fruits: their movements are light and elegant in the extreme, in this respect, differing greatly from the Colies; they pass with an easy gliding flight from tree to tree. The first and fourth toes being directed laterally, they are said to perch, for the most part, *lengthwise* on the horizontal branches, along which they walk, clasping the bough with their

two laterally disposed toes, while the other two are pointing forwards. They live either in pairs, or in families, according to the season; nest, like the Parrots, in the hollows of decayed trees, where they lay four eggs of a delicate whiteness.

Genus *Corythaix*. (Illig.)

The generic characters of the Touracos are the following:— The beak short, rather small, high, and greatly compressed; the frontal feathers reposing over, and concealing the nostrils: the ridge (*culmen*) high, and curving downwards to the tip: the lower mandible narrow: both mandibles distinctly notched at the tip, and finely [illegible]ted. The wings short, rounded; the first three quills graduated. The tail long, broad, and rounded at the extremity. The feet short, and strong; the middle toe longer than the tarsus; the lateral toes equal; the hind toe shortest; the external toe capable of being turned one fourth of the way backward. The claws short, thick, and much compressed.

The Touracos are among [illegible] charming of birds, having not only brilliance of colour to recommend them, but great elegance of form, and grace of motion. Their long and broad tail, and their high pointed crest, add much to their beauty. Their colour is almost always rich green, set off with gorgeous crimson or purple on the expanded wing. One of the most lovely of the known species, which now amount to seven in all, is the Fire-crested Touraco (*Corythaix erythrolophus*, Vieill.) of Western Africa, an individual of which species lived for some time in the gardens of the

Zoological Society in the Regent's Park.* The crest, which is copious, is of a red hue; the sides of the head, the ears, and the chin, as well as a

FIRE-CRESTED TOURACO.

patch around the eye, are white; the eye itself is large, red, and brilliant; the general plumage is

* Our engraving is copied from a figure in the "Penny Cyclopædia," xvi. 30, which was taken from this specimen during life.

green, inclining to bluish on the under parts; the quill-feathers are rich purple or violet; the beak is yellow; the feet greyish-black. The long silky crest of this beautiful bird, when under any excitement, is elevated into a somewhat conical form, compressed at the sides; and, when erected, imparts to the head an appearance as if covered with a helmet. The generic name applied to the bird alludes to this fancied resemblance, the word Corythaix (*κορυθαϊξ*), signifying one that moves the helmet. In a state of repose the crest-feathers fall down upon the head, and project behind.

We know but little of the manners of the Touracos in their native forests. Le Vaillant informs us that they usually keep on the highest branches of lofty trees, where, to the no small irritation of the eager naturalist, they were beyond the reach of his fowling-piece. An accident, in connexion with one of these birds, occurred to that enterprising traveller, which might have proved as tragical to him, as a similar misfortune did to the unhappy Drummond in the Sandwich Islands. Having succeeded, after many efforts, in bringing a Touraco to the ground, Le Vaillant searched for it in vain, and stamping with rage at his disappointment, he broke through into one of the covered pits which the Hottentots constructed for the entrapping of the large and ferocious animals, particularly elephants. "As soon," observes the naturalist, "as I began to recover from my surprise, I looked round to see how I might extricate myself from my embarrassing position, extremely happy that I had not been impaled on the sharp-pointed stake, placed upright in the bottom of the pit, and no less rejoiced that I found in it no company. I

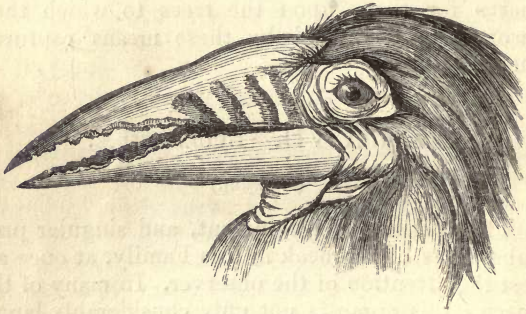
was, however, apprehensive that some might arrive every moment, especially if I should be compelled to remain there all night." To obviate such a necessity, he fired his fowling-piece at intervals; and at length heard shots in reply, which proved to be those of his faithful Hottentot attendants, by whom he was quickly delivered from his perilous situation. He did not, however, forget his Touraco, the innocent occasion of his misfortune; and now, by the aid of the dogs, which had accompanied the Hottentots, it was at length found, squatting under a thick bush. He afterwards set snares for them upon the trees to which they resorted to feed, and by these means captured them alive.

Family VII. Bucerotidæ.

(*Hornbills.*)

The enormous development, and singular protuberances of the beak in this Family, at once arrest the attention of the observer. In many of the species this organ is not only considerably larger than the head, but has an immense projection on its summit of various uncouth form, sometimes resembling a horn, sometimes the crest of a helmet, &c., which not unfrequently encroaches upon the skull far up towards, or even beyond, the crown of the head. The edges of both mandibles are more or less notched or jagged very irregularly, as if chopped with a blunt knife; but this is observed only in adult birds, and may perhaps be the result of the hardness of some description of their food.

The great size of the beak naturally induces the idea of great weight; and we wonder at the strength requisite for the bird to support and wield an organ so apparently heavy. The appearance, however, is deceptive; for by a beautiful provision of Creative wisdom, the horny case being thin, and the bony core being hollowed into numberless cells of various sizes and forms, with very thin walls between them, the requisite firmness of this organ is maintained, and associated with a surprising lightness.



HEAD OF BUCEROS NIPALENSIS.

The remaining characters of the Family may be thus briefly summed up. The nostrils are situated at the base of the beak, and are more or less rounded; the tongue is fleshy, and resembling that of the *Accipitres*, short and deep in the throat; the wings are rather short; the tail long, broad, and more or less rounded at the extremity, consisting of only ten feathers; the feet short, strong, and formed for walking and perching;

the outmost and inmost toes are both united to the central one at the base; the claws are short and blunt.

The Hornbills are birds of large size; few are smaller than a Crow, and some are much larger than a Raven; they are generally clad in sombre plumage, frequently relieved, however, with white in large masses; the beak and naked skin of the face often display bright colours during life. Their distribution is limited to Africa, India, and the great adjacent islands.

The singular structure of these birds, and the paucity of our information concerning their habits in a state of nature, have caused much diversity of opinion as to their true position and affinities. It is now, however, pretty well agreed that their nearest relations are to the Crows on the one hand, and to the Toucans on the other, and that they thus form a very interesting link of connexion between the Passerine or perching and the Scansorial or climbing birds. Professor Owen, by his dissection of a young specimen of *Buceros cavatus* (Shaw) that died at the Gardens of the Zoological Society, discovered some curious particulars in its anatomy, which tended to indicate the true place of the Family, as just stated.

Genus *Buceros*. (Linn.)

The technical characters of this genus have already been sufficiently indicated in those of the Family; as the two solitary species which have been separated from all the others, to form distinct genera, differ only in some slight peculiarities in the structure of the feet.

Upwards of twenty species of this genus are named, which are all natives of Africa, or India and its archipelago. Comparatively little is known of any of them, except so much as may be gained by inspection of their dried skins preserved in museums; though these evidences of their existence were very early objects of curiosity to Europeans, and conspicuously noted in catalogues, as "Horned Ravens," and "Rhinocerot-birds." Bontius, describing one under the name of "Indian Raven" (the *Buceros hydrocorax* of LINN.), which he met with in the Moluccas, observes, that it walks in the manner of the Crow of our countries, but differs much in disposition from our Crows, inasmuch as it feeds not on carrion, but most especially on nutmegs, devouring them so greedily as to do serious damage. Its flesh is very delicate, and when roasted has an aromatic flavour, evidently derived from its food. Of another species, "the Horned Indian Raven, or Topan, called the Rhinocerot-bird," he says, "This horned bird, as it casts a strong smell, so it hath a foul look, much exceeding the European Raven in bigness. It lives upon carrion and garbage, that is, the carcasses and entrails of animals; and waits upon the hunters who kill wild cattle, boars, and stags, to gorge itself with the offals." Major-General Hardwicke, in his account of *Buceros galeatus*, LINN., in the "Linnean Transactions," vol. xiv., thus describes the habits of the Hornbills generally:—"The progressive motion of the birds of this genus, although their feet are formed for walking, is always by jumping or hopping. I have kept several species alive, and they all moved in the same manner. In a state of

nature these birds, in this part of India (Malacca), live on wild fruits. In confinement they feed freely on plantains and on boiled rice. At night they perch with great security, though the largeness of the foot seems better suited to rest on the ground." Other writers state that these birds feed also upon small quadrupeds, birds, and reptiles, pressing them flat in their beak, then tossing them in the air, catching them in the throat, and swallowing them whole. In this latter habit, no less than in the omnivorous character of their appetite, the Hornbills present a remarkable resemblance to the Toucans.

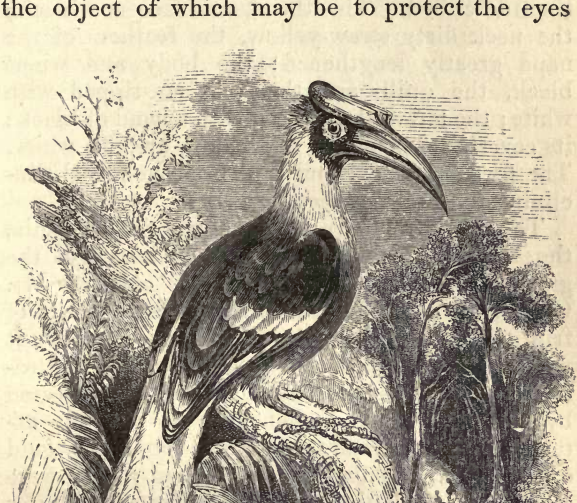
Mr. G. R. Gray, in his beautiful work on "The Genera of Birds," thus sums up the habits of this singular genus: — "They are usually observed singly, or in small or large parties, in the dense forests or jungles, perched or squatted longitudinally on the highest branches, especially those of elevated and decayed trees in the neighbourhood of rivers. On the approach of day-light they leave their roosting-places, and proceed to the neighbouring forests in search of fruit-bearing trees, hopping from branch to branch for the fruits which constitute their food; and when evening returns they again repair to the place that they had left at day-light. When they have cleared one neighbourhood of its food, they resort to a fresh locality; which occasions them to be observed at different periods in various places. . . . . Their flight is heavy and straight, generally at a considerable height; and they make a remarkable noise in striking the air with their wings. The cry consists of a short hoarse croak, but when the bird is excited this is changed to a

loud discordant noise. They perforate the trunks of trees from the side, making a hollow in the wood, in which the nest is formed; and the female usually lays four eggs." The noise alluded to in the above description, produced by the flapping of their heavy wings in flight, combined with that occasioned by the clattering of their mandibles, is said to be so great as to inspire terror, when the cause is unknown; and to resemble those flaws of rough and sudden winds, which often rise so unexpectedly in tropical regions, and blow so violently. The larger species are extremely shy, and difficult of approach: like some of the *Corvidæ*, they usually perch on the leafless branches of the loftiest trees, when their vision, unimpeded by foliage, ranges over a wide extent.

The singular excrescences which in most of the species arise from the beak, sometimes equalling that organ, large as it is, in size, not only in different species vary much in form and size, but even in the same species at different stages of its life; indeed, in very young birds there is no trace of its existence.* The perpendicular furrows which are seen on the sides of the upper mandible, are supposed by the Europeans resident in the Moluccas to be dependent on age, one being acquired every season; and hence they give the Hornbills the appellation of *Jerar-vogel*, or *Year-birds*. We have remarked on its lightness, owing to its cellular structure, permeated by air; but it is also observable that the bones of the body and limbs are more completely penetrated by this

* The knife-like ridge on the summit of the beak in *Crotophaga ani*, is in like manner totally wanting in the young bird; as we have found by personal observation.

fluid than those of any other birds; for Professor Owen found that air passed into the extreme bones of the wing, and into the joints of the toes. The eyelids are fringed with stout and stiff lashes, the object of which may be to protect the eyes



HORNBILL.

from particles of dust and rotten wood falling on them, when engaged in excavating decayed trees for the purpose of incubation. The *Crotophaga*, whose beak presents an analogy to that of the Hornbills, has the eyes similarly protected: this bird, however, does not excavate trees.

We select for illustration of the genus the Concave Hornbill (*Buceros cavatus*, SHAW), a specimen of which lived for sometime at the menagerie of the Zoological Society in the Regent's Park. It is thus described. The throat and face are black; the neck dirty straw-yellow, the feathers of the nape greatly lengthened: the body and wings black, the quills and their coverts tipped with white; the tail white, crossed with a band of black; its coverts, both above and below, are also white. The feet are black, and the beak yellowish, inclining to scarlet at the tip.

The Concave Hornbill is a native of India, the Himalayan mountains, Java, and most of the great islands adjacent. "Its food," observes Mr. Gould, "like that of other Hornbills, consists of fruits, berries, flesh, and even carrion; in short, it may be considered as strictly omnivorous." * Professor Owen remarks that the specimen dissected by him was observed when alive to be more attached to animal than to vegetable food, and would quit any other substance, if a dead mouse were offered to it. This it would swallow entire, after squeezing it twice or thrice with the beak, and no castings were noticed. Petiver, however, has borne testimony to its habit of regurgitation.

Respecting the purpose to be fulfilled by the great size and remarkable appurtenances of the beak in this genus, we have nothing better to offer than ingenious conjectures: as a specimen of which we may quote the remarks of an eminent zoologist, Mr. W. C. L. Martin, though they do not appear to us very satisfactory. "Active and alert, notwithstanding the magnitude of their

* Gould's Cent. of Birds.

beaks, these birds lightly traverse the branches of the forests and leap from one to another till the highest is attained: they then often stop and utter a loud roaring sound, which may be heard at a considerable distance. . . . . The noise thus uttered, and which is most probably their call-note, throws a light upon the design of the hollow protuberance surmounting the bill; it acts as a sounding-board, increasing the reverberations of the air. With regard to the huge beak itself, many conjectures have been entertained as to its peculiar uses. It has been suggested as a reason for its development, that it perhaps constitutes a necessary weapon of defence against monkeys and other animals, which may seek to assail its nest; while some have supposed that it might be employed in dragging snakes and lizards from their lurking places, or young birds and eggs from the recesses of the trunks of aged trees."*

* Pict. Mus. i. 350.

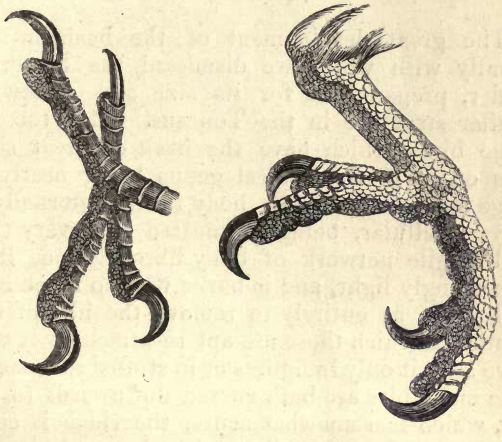
ORDER III. SCANSORES.

(*Climbing Birds.*)

The association of the Families usually arranged in one group, under the above title, or that of *Zygodactyli*, or yoke-footed birds, is by most naturalists felt to be unsatisfactory. Unlike in food, in form, in habits, and economy, the single character which they have in common, is that their four toes are arranged in two pairs, the outer toe being turned backward more or less permanently, like the thumb, so that these are opposible to the middle and inner toes, which point in the opposite direction. From this structure results a more efficient power of grasping, or of clinging to perpendicular or reversed surfaces, associated with climbing habits in the principal Families, as those of the Parrots and the Woodpeckers.

In the other Families, however, those of the Toucans and the Cuckoos, this disposition of the toes is not accompanied with the power of climbing, properly so called; though the latter, and perhaps the former, do certainly move about the branches of trees, in a manner diverse from that employed by the true perching or Passerine birds. At the same time it must be borne in mind that the faculty of climbing, even if common to the whole of this Order, is by no means peculiar to it; as the Creepers and Nuthatches, whose toes are arranged on the Passerine type, can climb and

even run on perpendicular and inverted surfaces with much more facility than any of the so called Scansorial birds.



FOOT OF PARROT AND OF WOODPECKER.

As so little can be predicated of these birds in common, with the exception of the structural peculiarity above-noted, we defer the summary of habits and economy, until we define the respective Families which are included in the order. These are four in number, *Rhamphastidæ*, *Psittacidæ*, *Picidæ*, and *Cuculidæ*. Of these, the first is confined to the southern portion of the New World; the others are spread widely over both hemispheres.

Family I. Rhamphastidæ.

(*Toucans.*)

The great development of the beak in the Family with which we dismissed the Passerine Order, prepared us for its size and somewhat similar structure in the Toucans. They too are large birds, which have the beak of great size, this organ in the typical genus being nearly as large and as long as the body itself: internally it is very cellular, being permeated by a very thin and fragile network of bony fibres; hence it is exceedingly light, and is borne with so much ease and grace as entirely to remove the idea of uncouthness which those are apt to attach to it who have seen it only in figures or in stuffed specimens. The mandibles are both curved downwards to the tip, which is somewhat acute, the ridge is commonly rounded, the edges of both mandibles are regularly notched at wide intervals. The tongue is long, slender, and barbed on each side, so as to resemble a narrow feather, the beards directed forwards. The wings are short and rounded; the tail long and broad. The feet, though yoke-toed, seem to be rather adapted for grasping than climbing, and much resemble those of the Cuckoos.

The *Rhamphastidæ* are confined to the tropical parts of continental America, where they reside in the depth of the magnificent forests, associating in small flocks, which are said frequently to include several distinct species. They feed on the eggs and nestlings of small birds, on fruits, and also on insects. Their motions are light and elegant to

an extreme degree, leaping from bough to bough with the most graceful agility; their flight, however, is laboured, and in straight lines; and though rapid, is evidently attended with much exertion; they fly with difficulty against the wind, raising the beak above the axis of the body, and propelling themselves at short intervals. They nestle in hollow trees, excavating the decaying wood with their beaks, and lay in the cavity two eggs, of a round form, and delicately white in hue.

Genus *Rhamphastos*. (Linn.)

The Toucans proper have the beak ungrooved, thicker than the head; the nostrils entirely concealed, and placed at the edge of the thickened frontlet of the beak. The wings are short; the four outmost quills graduated, and abruptly pointed. The tail is comparatively short; squared or but slightly rounded at the extremity. In their internal anatomy they are remarkable for the *clavicles* being separate, instead of uniting to form the *furcula*, or merrythought. They are birds of large size, generally black on the upper parts, with vivid colours, chiefly red and yellow, on the throat and breast. The beak is often tinted with brilliant hues, which vanish after death.

We know but little of the habits of the Toucans in their native forests, but in captivity the manners of two species have been detailed in interesting memoirs by Mr. Broderip and Mr. Vigors. The former of these gentlemen was informed by Mr. Swainson who had seen these birds in the forests of Brazil, that he had frequently observed them perched on the tops of lofty trees, where

they remained as if watching. This circumstance, combined with others connected with the remains of food found in the stomachs of such as he dissected, had induced him to suspect that the Toucans were partly carnivorous, feeding on the eggs and young of other birds, as well as fruits and berries; and that while perched upon these high trees, they were in fact busily employed in watching the departure of the parent birds from their nests. Mr. Swainson, however, had never detected a Toucan in the fact, nor were his dissections quite conclusive as to the animal nature of their food. Dr. Such also informed Mr. Broderip that he had seen these birds in Brazil, frequently engaged in quarrels with the monkeys, and that he was certain that they fed on eggs and nestlings, as well as on a certain fruit called the toucan-berry.

These presumptions were abundantly confirmed by the carnivorous appetite of the specimen seen by Mr. Broderip in a state of captivity. The bird had been fed exclusively on vegetable food; but one day, a Canary having escaped from its cage, and approached that of the Toucan, the latter was extremely excited, and on the barrier being removed it instantly seized the Canary and devoured it. On hearing of this incident, Mr. Broderip went to see the Toucan, and requested the keeper to bring in a small bird, in order to observe the result. On a Goldfinch being introduced into the cage, it was eagerly seized, and killed in a moment by the pressure of the powerful beak. Then holding it on the perch with one foot, the Toucan proceeded to strip off the feathers; after which he broke the bones of

the limbs by a strong lateral wrench with his beak, and, tearing it to pieces, devoured it portion by portion, with the highest manifestations of enjoyment. Ever and anon he would take the prey in his beak, and hop with it from perch to perch, making a hollow clattering noise, and shivering his wings. The beak and feet of his prey gave him the most trouble, but he devoured the whole, and evidently with great relish; "for whenever he raised his prey from the perch, he appeared to exult, now masticating the morsel with his toothed bill, and applying his tongue to it, now attempting to gorge it, and now making the peculiar clattering noise, accompanied by the shivering motion above mentioned." After this, animal food was mixed with the diet of this bird, in the form of meat, varied with a living bird occasionally; and it was observed that he greatly preferred the animal to the vegetable diet, carefully picking out all the morsels of the former before he would eat the latter.

There is a peculiarity connected with the repose of the Toucans which is worth noticing, as it was observed in the species seen by Mr. Broderip, and in that in the possession of Mr. Vigors. The latter gentleman observes of his specimen, that its habits were singularly regular. As the dusk of evening approached, it finished its last meal for the day, took a few turns, as if for exercise, around the perches of its cage, and then settled on the highest, disposing itself at the moment of alighting in its singular posture of preparatory repose, its head drawn in between the shoulders, and the tail turned up vertically over its back. In this posture he generally remained about two

hours, in a state between sleeping and waking, his eyes for the most part closed, but opening on the slightest interruption. At such times he would allow himself to be handled, and would even take any favourite food that was offered him, without altering his position further than by a gentle turn of the head. He would also suffer his tail to be replaced by the hand in its natural downward posture, and would then immediately return it again to its vertical position. In these movements the tail seemed to turn as if on a hinge that was operated on by a spring. At the end of about two hours he began gradually to turn his bill over his right shoulder, and to nestle it among the feathers of his back, sometimes concealing it completely within the plumage, at other times leaving a slight portion of its upper edge exposed. At the same time he drooped the feathers of his wings and those of the thigh-coverts, so as to encompass the legs and feet, and thus nearly assuming the appearance of an oval ball of feathers, he secured himself against all exposure to cold.*

The writer of this work had for some little time in his possession a specimen of the Keel-beaked Toucan (*Rhamphastos carinatus*, SWAINS.), which he brought to England from Jamaica. The species is not, however, a native of the West Indian islands, but of the northern extremity of South America, whence this specimen was originally procured, and the southern provinces of Mexico. We do not recollect having ever observed the upturning of the tail during repose, spoken of in the two species above-noticed. It was in the highest health

* Zoolog. Journal, vol. ii.

and spirits; and its movements were lively and graceful, leaping from side to side of its cage, or from perch to perch, with untiring agility. It had

KEEL-BEAKED TOUCAN.

been accustomed to occasional liberation from its cage into a large yard occupied by poultry, and this degree of freedom it was fond of, never returning to captivity, without many efforts to

escape; but it was not at all shy or timid. The beak, though very thin and light, was far from displaying that parchment-like flexibility spoken of by some writers; on the contrary, it was firm and strong. We were accustomed to lift the bird by the beak, when we wished to handle it, to place it in the cage, or to take it out, as we would take hold of a rabbit by its ears; and the Toucan manifested no sign of pain or even inconvenience. It was fed principally with rice, boiled to a firm consistence; it was also very fond of ripe mangoes, pine-apples, and other fruits. Its mode of feeding was to pick off a portion of the pulpy fruit, or to take up a lump of the agglutinated rice, with the point of the beak, and then by a backward jerk of the head, toss the morsel into the throat: we never saw it attempt to throw its food into the air, and catch it. It was not indulged with animal food.

The Keel-beaked Toucan is conspicuous for the number and brilliancy of the hues that adorn its beak, which is of large size. It is remarkable also for the thin ridge or keel which runs along the upper edge of this organ; this ridge, as well as the edges of the upper mandible, is of a golden yellow; the sides are rich green; and the lower mandible is blue changing into green; the tips of both mandibles are scarlet; a narrow band of black surrounds the base of the beak. The naked skin which environs the eyes is violet, as are also the feet. The plumage of the throat and breast is lemon-yellow, margined by a crescent-band of scarlet at the lower part. The upper tail-coverts are white, and those beneath are scarlet. All the rest of the plumage is of a shining black.

This beautiful species was considered, when Mr. Gould published his magnificent monograph of the *Rhamphastidæ*, as very rare; though it was seen alive by Edwards in the last century. Within a few years, however, several living individuals of this species have been brought to this country, most of which are in the noble menagerie of the Earl of Derby at Knowsley.

Family II. Psittacidæ.

(*Parrots.*)

In their general form, the structure of their beak, the cere that encloses its base, their thick and fleshy tongue, the arrangement and form of their toes, the scales with which their feet are clothed, many details of their internal anatomy, combined with their remarkable habits, and their great intelligence and docility,—the Parrots differ very widely from the Families with which they are usually associated, and form a group compact and well-defined among themselves, but isolated in a remarkable degree from all others. Many Naturalists of eminence, indeed, do not hesitate to assign to the Parrots the rank of an Order, commencing the series with them, thus making them precede the Birds of Prey, as the *Quadrumana*, which they are supposed to represent, are put before the *Carnivora*. "If we except," says Mr. Blyth, "the trivial character of their outer toe being reversed, —and their foot, even, is in all other respects extremely different,* and covered with small tubercle-like scales, instead of plates as in all the

* See the Engraving at page 177.

Passerinæ, and the rest of the yoke-footed genera without exception,—they have absolutely nothing in common with the other *Zygodactyli* [or *Scansores*] that should entitle them to range in the same special division: their whole structure is widely at variance, and if there be one group more than another to which they manifest any particular affinity, it is that of the Diurnal Birds of Prey, which, we conceive, should range next to them, though still very distantly allied. They certainly accord with the Falcons more than with any other bird in the contour of the beak, and the nostrils are analogously pierced in a membrane termed the cere: they have a similar enlargement of the œsophagus [or gullet], which occurs in no other zygodactyle bird, but which is glandular as in the Pigeons, secreting a lacteal substance with which the young are at first nourished; the Parrots and Pigeons being almost the only birds which subsist exclusively on vegetable diet at all ages." *

On the other hand, most naturalists, in their systematic arrangements, and even many of those who argue for a different position and rank, agree to retain these birds in the situation and relationship in which they were placed by Linnæus, viz., in immediate proximity to the Toucans and Woodpeckers. And, in defence of this arrangement, we will refer to the interesting observations of Mr. Vigors, whose perceptions of the affinities of birds have perhaps never been surpassed. That ornithologist, while he places the Parrots next to the Toucans, and concurs in the general views which bring these birds into neighbouring

* Cuvier's Anim. Kingd. (Lond. 1840), p. 218.

groups,—acknowledges that he is unacquainted with any forms which soften down the important difference between the bills and tongues of the one and the other of these Families; and declares his opinion that the *Psittacidæ* afford more difficulties to the inquirer than any other known group in the whole Class.

HEAD OF MACAW.

Between the Parrots and the Woodpeckers there seemed to Mr. Vigors, at first, to be an equal diversity, arising from the structure of the beak and tongue, but he was decided in his opinion of their proximity, by observing that while there is no other group with which the former accord more closely in such characters, they possess an affinity to no birds but the *Picidæ*, in the structure of the foot and the use to which they apply it. Of the birds commonly considered as

Climbers, possessing yoked toes, he remarks that the Parrots and the Woodpeckers are the only families whose toes are strictly and constantly disposed in pairs; the external toe of the other *Scansores* being retractile; and these latter are never seen to climb, at least to that extent which is common to the two families in question. "We may thus venture," he continues, "to separate the Parrots and Woodpeckers from the other Families, and to associate them together, in consequence of the affinity in these essential characteristics of the tribe. In this point of view they will compose its normal groups as Climbers *par excellence;* differing, however, as to the mode in which they climb; the Parrots using the foot chiefly in grasping the object, which assists them in their ascent, and in conjunction with the bill, while the *Picidæ* rely upon the strength and straightness of the hind toes, in supporting them in a perpendicular position on the sides of trees; in which posture they are also assisted by the strong shafts of the tail feathers. While I was influenced by these general points of coincidence in placing the *Psittacidæ* and *Picidæ* together, I recognised a group which appeared to intervene between them, and to diminish the apparent distance that exists even in the form of their bill. That important group which comprises the Linnæan *Barbets*, evidently exhibited the expected gradation in the structure of that member; the bill of *Pogonias*, Illig., approaching most nearly that of the Parrots, by its short, strong, and hooked conformation, while the straighter and more lengthened bill of the true *Bucco* united itself to that of *Picus*. Many other particulars in form, and also in extraordi-

nary conformity in colouring, still further pointed out the affinity; and I was at length confirmed in my conjectures respecting the situation of these birds, by arriving at a knowledge of their habits being actually those of the true Woodpeckers, and of their chief affinity being to that group. The regular gradation by which these two families, united in their general characters, and those the characters, it must be remembered, most prominent and typical in their own tribe, are also united in their minuter points of formation, appears to me now eminently conspicuous."

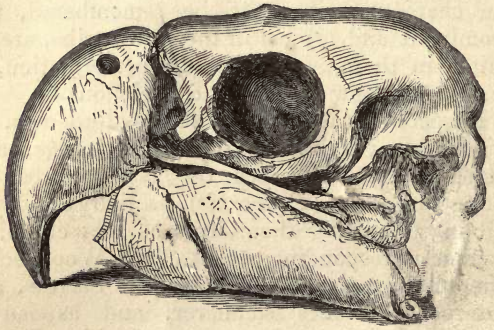
Respecting the minuter points alluded to, Mr. Vigors remarks that some of the *Psittacidæ*, among which he particularises the Ring-necked Parroquets of India (*Palæornis*), partially employ the tail in supporting themselves as they climb, in a manner corresponding to that of the Woodpeckers. The tongue, also, peculiar to the Parrots, as he observes, becomes slenderer, and as is said, more extensible in that group of which *Psittacus aterrimus*, Gmel., is the representative; thus evincing an approximation, slight indeed, but still an approximation, to that of the Woodpeckers.*

The technical characters by which the *Psittacidæ* are distinguished may be briefly summed up as follows: The beak is very short, the upper mandible greatly curved downward at the tip, and overhanging the lower, which is much shorter, and, as it were, abruptly cut off at the extremity: the upper mandible is moveable: its base is enveloped in a cere, in which the nostrils are pierced. The tongue is thick, fleshy, and undivided. The

* Linn. Trans., vol. xiv.

feet are short and broad, and covered with numerous small rounded scales.

The power of moving the upper mandible, which is wanting to the *Mammalia*, is common, and almost universal, among Birds. In the present Family, however, it is much more highly developed than in other birds; the mandible not being



SKULL OF MACAW.

connected into one piece with the skull, by elastic and yielding bony plates, as is the case with birds in general, but constituting a particular bone, distinct from the rest of the skull, and jointed to it. This mobility is rendered more conspicuous by the circumstance of their vigorous jaws being set in motion by a greater number of muscles than are found in other birds. The advantages of this peculiarity of structure are obvious, when we remember the use which a Parrot makes of this organ, as a third hand, to assist it in climbing from bough to bough, or about the bars of its cage when in confinement.

The soft and thick tongue so characteristic of the Parrots, is doubtless a highly sensitive organ of taste. It is covered, like that of the *Mammalia*, with *papillæ*, and being moistened by a constant secretion of saliva, they are able to select and taste different kinds of food. In some of the Australian species, which suck the nectar of flowers, the tongue, while retaining the thick form and fleshy structure common to the Family, is distinguished by the peculiarity of terminating in a number of very delicate and close-set filaments, which can be protruded and expanded like a brush. Mr. Caley records that one of these species (*Trichoglossus hæmatodus*, Vig.) in confinement, on being shewn a coloured drawing of a flower, applied the tip of its tongue to it, as if it would suck it; and on another occasion made a similar attempt on seeing a piece of printed cotton furniture.

The Parrots are adorned with the richest and most brilliant hues, of which a soft and lustrous green may be considered as the most prevalent, varied, however, with scarlet, yellow, and blue, in profusion, usually arranged in broad and well-defined masses. Though susceptible of increased lustre from the play of light, particularly in such as are of green hues, the plumage of the Parrots does not reflect any proper metallic radiance. They are widely scattered over the warmer regions of the globe, extending far into the southern temperate zone, but scarcely appearing beyond the tropic on the north side of the Equator. The species, which are exceedingly numerous, are for the most part very local; every large island, in the East and West Indies, and even in the groups

of Polynesia, having kinds peculiar to itself. The largest and most richly coloured are the Macaws of South America and the Antilles.

BLUE AND YELLOW MACAW.

The food of this Family consists almost exclusively of fruits; to which are added, by some of the Australian species in particular, the succulent

parts of vegetables, bulbous roots, and unripe grain, when in a soft and milky condition. The grasping power of the foot is commonly used for the carrying of food to the beak, as if it were a hand; and the great mobility of the mandibles, aided by the fleshy tongue, enables the bird to discuss its food with much skill and discrimination, even to the performance of such a feat as Mr. Martin mentions as having often seen: "the clearing of the inside of a fresh pea from the outer skin, rejecting the latter; the whole process performed not only with facility, but with the greatest delicacy of manipulation, if this term be allowable." *

Parrots are monogamous; that is, a single male attaches himself to a single female; the eggs are deposited in the holes of decayed trees, or in the centre of the monstrous nests, so common in the tropics, formed by *Termites*, the crisp, earthy walls of which are easily chiselled away by the strong beaks of these birds. They associate in numerous flocks, whose flights from tree to tree present the most brilliant appearance, as the rays of a tropical sun glance from their gorgeous backs and wings. Their voices are loud and harsh; and of most of the species the screams have a piercing and grating character almost intolerable. Yet these are capable of wonderful modulation; the power which is possessed by many species of imitating the words of human language, the notes of vocal music, the calls of animals, and almost any sounds articulate or inarticulate, is well known; especially as developed by their extreme docility and memory, in the education of a state of cap-

* Pict. Mus. i. 362.

tivity. This faculty is possessed by the various genera, however, in very different degrees.

Extraordinary examples of the imitative talent in these birds are on record, combined in some instances, at least, with what looks so like intelligence as to cause surprise and admiration. We quote the following interesting account from the "Gleanings" of Mr. Jesse, the more readily as that accurate observer seems, from his introductory remark, in some degree to authenticate the marvellous statement.

After speaking of the renowned Parrot belonging to Colonel O'Kelly, Mr. Jesse proceeds thus:—"There is another Parrot, which is occasionally brought from Brighton to Hampton Court, that appears to equal it in intelligence and power of imitation. I had seen and heard so much of this bird, that I requested the sister of its owner to furnish me with some particulars respecting it. The following is her lively and brilliant account of it:—

'As you wished me to write down whatever I could collect about my sister's wonderful Parrot, I proceed to do so, only premising that I will tell you nothing but what I can vouch for having myself heard. Her laugh is quite extraordinary, and it is impossible to help joining in it oneself, more especially when in the midst of it she cries out, "Don't make me laugh so. I shall die, I shall die;" and then continues laughing more violently than before. Her crying and sobbing are curious; and if you say, "Poor Poll! what is the matter?" she says, "So bad! so bad! got such a cold!" and after crying for some time will gradually cease, and making a noise like drawing

a long breath, say, "Better now!" and begin to laugh.

'The first time I ever heard her speak, was one day when I was talking to the maid at the bottom of the stairs, and heard what I then considered to be a child call out "Payne! (the maid's name) I am not well, I'm not well!" and on my saying, "What is the matter with that child?" she replied, "It 's only the Parrot; she always does so when I leave her alone, to make me come back;" and so it proved; for on her going into the room the Parrot stopped, and then began laughing, quite in a jeering way.

'It is singular enough, that whenever she is affronted in any way, she begins to cry, and when pleased, to laugh. If any one happens to cough or sneeze, she says, "What a bad cold!" One day, when the children were playing with her, the maid came into the room, and on their repeating to her several things which the Parrot had said, Poll looked up, and said, quite plainly, "No, I didn't." Sometimes, when she is inclined to be mischievous, the maid threatens to beat her, and she says, "No, you won't." She calls the cat very plainly, saying, "Puss! puss!" and then answers, *mew:* but the most amusing part is, that whenever I want to make her call it, and to that purpose say, "Puss! puss!" myself, she always answers *mew*, till I begin mewing, and then she begins calling puss as quick as possible. She imitates every kind of noise, and barks so naturally, that I have known her to set all the dogs on the parade at Hampton Court barking; and the consternation I have seen her cause in a party of cocks and hens, by her crowing and clucking,

has been the most ludicrous thing possible. She sings just like a child, and I have more than once thought it was a human being; and it was ridiculous to hear her make what one should call a false note, and then say, "Oh, la!" and burst out laughing at herself, beginning again quite in another key. She is very fond of singing "Buy a Broom," which she says quite plainly; but in the same spirit as in calling the cat, if we say, with a view to make her repeat it, "Buy a broom," she always says, "Buy a *brush*," and then laughs, as a child might do when mischievous. She often performs a kind of exercise, which I do not know how to describe, except by saying that it is like the lance exercise. She puts her claw behind her, first on one side and then on the other, then in front, and round over her head, and whilst doing so, keeps saying, "Come on! come on!" and, when finished, says, "Bravo! beautiful!" and draws herself up. Before I was as well acquainted with her as I am now, she would stare in my face for some time, and then say, "How d'ye do, ma'am?" this she invariably does to strangers. One day I went into the room where she was, and said, to try her, "Poll, where is Payne gone?" and, to my astonishment, and almost dismay, she said, "Down stairs." I cannot, at this moment, recollect anything more that I can vouch for myself, and I do not choose to trust to what I am told; but from what I have myself seen and heard, she has almost made me a believer in transmigration.'"*

The species alluded to in this sprightly note, Mr. Jesse has not named; we may conjecture it to have been the Grey African Parrot (*Psittacus*

* Gleanings, p. 218.

erythacus, LINN.), as that species is the most renowned for its powers of imitative speech, and is the most commonly kept in captivity. We shall illustrate the Family, however, by a genus of ancient renown.

GENUS *PALÆORNIS*. (VIG.)

The Ring Parroquets, as the birds of this genus are termed, are distinguished by having the beak rather thick; the upper mandible dilated, the upper part (*culmen*) round; the lower mandible broad, short, and notched on the margin. The wings are moderate; the first three quills nearly equal, and longest; the outer webs of the second, third, and fourth, gradually broader in the middle. The tail is graduated; that is, the feathers diminish in length from the centre outward; the middle pair much exceed the rest in length, and are very slender. The feet are short and weak, the claws rather slender, and hooked. The general form is taper and elegant, the plumage smooth and silky: the ground-colour is usually green, sometimes merging into yellow; the neck is marked with a narrow line running round it like a collar.

The accounts we find in the ancient Greek authors, of Parrots known to them, refer to some species of this beautiful genus, as we gather from their descriptions. Some three or four kinds they appear to have been familiar with, which were first introduced into Europe at the time of the conquest of India by Alexander the Great, and one of which has been named in commemoration of him, *Palæornis Alexandri*. In their native

regions, we are informed, they were the favourite inmates of the palaces of princes, and on their in-

ALEXANDRINE PARROQUET.

troduction into Greece, whence they soon found their way to Rome,—soon came into general and deserved estimation, for the symmetry of their

form, the grace and elegance of their motions, the beauty of their colours, their great docility, and imitative powers, and their fond attachment to those by whom they were domesticated and treated with kindness. Amid the luxury of Rome, the "Indian Bird" was kept in cages of the most costly materials, nor was any price, however great, deemed extravagant, or beyond its value.

The naturalists and the poets are eloquent on the varied attractions of these charming birds, descanting with admiration on the brilliant emerald plumage, the rosy collar of the neck, and the deep ruby-red hue of the beak. The species with the whole head of a changeable blossom-colour, we may reasonably infer, were unknown to them, for we cannot imagine they would have been silent on so conspicuous a feature of loveliness. Modern research has made us familiar with some eleven or twelve species, which are as generally favourites with us as with their early classical admirers. They are spread over the Indian continent and Archipelago, from the foot of the Himalaya mountains to the northern coasts of Australia.

The Alexandrine Parroquet has the general plumage of a beautiful green hue; the collar which adorns the neck is bright red, and a spot of dark purplish red marks the shoulders; the throat and a band between the eyes are black; the beak is of a rich ruby tint. The large island of Ceylon, the Taprobane of the ancients, is the principal resort of this beautiful species at this day; and it was from this island that it was first sent to the Macedonian conqueror whose name it bears. In captivity it is an affectionate and engaging bird, courting the notice and caresses of those whom it

loves. It readily learns to pronounce words with considerable distinctness.

Family III. Picidæ.

(*Woodpeckers.*)

Some of the distinctive peculiarities of this strongly marked Family have been incidentally presented to the reader, in tracing the affinities of the Parrots, but we will now detail them more at length. The Woodpeckers are the most typical birds of their Order, for their whole organization is rendered subservient to the particular faculty of climbing, and hence they are eminently *Scansores.*

The feet are very short, but of unusual strength; the rigid toes diverge from a centre, two pointing forward and two backward; and the claws are large, much curved, and very hard and sharp. The bones which form the base of the tail are large, and bend downward in a peculiar manner, so that the tail feathers do not, as in other birds, follow the line of the body, but are thrown in beneath it, their points pressing against the surface on which the feet are resting: and as the shafts of the tail-feathers are remarkably stout, rigid, and elastic, and are produced into stiff points, the barbs also being stiff and convex beneath, a powerful support is gained in the rapid perpendicular ascent of the bird up the trunks of trees, by the pressure of this powerful organ against the bark. Another peculiarity observable in the structure of the Woodpeckers, and one admirably adapted to their habits, is the small size of the keel of the breast-bone. "Moderate powers of

flight," observes Mr. Yarrell, "sufficient to transport the bird from tree to tree, are all that it

GREAT SPOTTED WOODPECKER.

seems to require: large pectoral muscles, with a deep keel to the breast-bone, would to this bird be an inconvenience. The advantage of a narrow, shallow keel is immediately apparent, on looking

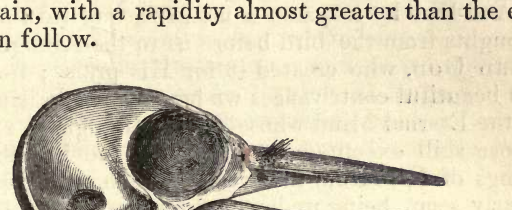
at a representation of the skeleton in a climbing position: the low keel allowing the bird to place its body close to the tree, to bring its centre of gravity in a perpendicular line before the points of support, and thus materially to diminish the labour of, and the strain upon, the muscles of the legs and thighs."*

The beak is hard and compact in its texture, in some species nearly resembling ivory, stout at the base, and tapering, with angled sides, to the point, which is sharpened to an edge, like a small chisel; or perhaps, the whole form may be likened to a short but stout iron nail with a flattened point. The value and efficiency of this organ will be apparent when the economy of the bird is known; it obtains its food, consisting of the larvæ of wood-boring insects, by chiselling away the bark and surrounding wood, until the subtle grub is exposed. The head, then, acts as a hammer, of which the beak is the face or point, and the curved neck the handle, and being moved by muscles of great energy, the sharp and wedge-like beak-tip is propelled against the tree in a succession of strokes given with extraordinary force and rapidity.

But as the labour required actually to chisel out every grub on which the Woodpecker subsists, would be immense, effective as its weapon is, and rapid as is its execution, there is yet another admirable contrivance which we must notice, by which the prey being once exposed, is dragged from his tortuous hiding-places, and inmost crevices. The tongue is tapered to a slender horny point, and its length is extraordinary: for it passes behind into two cartilaginous filaments, which passing under

* Brit. Birds, ii. 140.

the chin, one on each side of the throat, go completely round the back of the head, and meeting at a point on the forehead, are there inserted into the skull. These branches being highly elastic, free through their whole length, except at the very extremity, and moved by proper muscles both of extension and retraction, are capable of being alternately lengthened and shortened, by which motion the horny tip of the tongue is propelled far beyond the point of the beak, and drawn in again, with a rapidity almost greater than the eye can follow.



SKULL OF WOODPECKER.

Add to this, that there is on each side of the head a very large gland, which secretes a glutinous substance; this gland being embraced and compressed by the action of the muscle that protrudes the tongue, the viscid matter is poured out upon the sides of the tongue as it is thrust forth, and this is sufficiently adhesive to attach small insects, such as ants, small grubs, beetles, &c., which are quickly drawn in and swallowed. But as many of the boring larvæ are too heavy thus to adhere, and would hold on by their tuberculous feet, or by their strong jaws, the capture of such is effected

by the horny tip of the tongue being set with numerous fine barbs on each side, pointing backwards; the fine point readily pierces the skin of the insect, the barbs yielding as it enters, but when once within it cannot without much force be withdrawn, the barbs having expanded within the skin, and so the insidious grub, despite his efforts to maintain his tenancy, is dragged forth by the powerful contraction of the Woodpecker's elastic tongue.

And here let us pause a moment, and turn our thoughts from the bird before us to the Almighty LORD GOD, who created it for His praise; from the beautiful contrivances we have been admiring, to the Eternal Mind whose wisdom designed, and whose skill executed them. "For the invisible things of Him from the creation of the world are clearly seen, being understood by the things that are made, EVEN HIS ETERNAL POWER AND GODHEAD;" so that we should be without excuse, if, discerning such wondrous proofs of the fatherly love of God even to his irrational creatures, we "glorified Him not as God, neither were thankful."

The Woodpeckers are widely scattered over both continents; no representative of the form has, however, been discovered in Australia. They chiefly affect the forests, and are among the comparatively few birds that do habitually prefer their solemn sylvan recesses. Their flight is weak and undulating; their voices loud, harsh, and sudden. They lay their eggs and bring up their young in capacious chambers, which are hollowed out of the trunks of trees by the means of their powerful beaks. Their compact, well-built form indicates strength rather than grace: their pre-

vailing hue is black, often handsomely spotted with white, and varied with brilliant red, the latter especially upon the head. Our commonest British species has a yellowish-green for its prevailing colour, instead of the more sombre ordinary hue.

Genus *Picus*. (Linn.)

The typical Woodpeckers have the beak perfectly wedge-shaped, cylindrical, the upper edge straight, the lateral ridges removed from the *culmen*. The outer hind toe is longer than the outer fore one: the wings are somewhat lengthened and pointed, with the third quill longest. The colours of the plumage are chiefly black and white, the latter arranged on the upper parts in large patches or bars. The genus is distributed over both hemispheres.

The Greater Spotted Woodpecker (*Picus major*, Linn.), though not quite so common in our island as the Green Woodpecker (*Brachylophus viridis*, Linn.), is more widely spread, extending even to the northern extremity of Scotland and to Ireland. It is found also in all parts of the continent of Europe, from the pine forests of Norway, to the orange-groves of Italy.

This species, which in some of the counties of England is called the Witwall, the Wood-pie, and the French-pie, is about as large as a Blackbird, but of a stouter form. The colour of the upper parts is black, marked on the head, neck, and shoulders with large patches of white, and chequered on the wing-quills with square white spots in alternating bars; the hind head is of a rich crimson hue; the under parts are of a dull white,

except the vent and under tail coverts, which are red.

The Spotted Woodpecker is much more strictly an arboreal bird than the green species. It climbs with great ease and dexterity, traversing the

SPOTTED WOODPECKER.

trunks and limbs of trees in all directions, perpendicularly, and horizontally, and digging with great diligence and effect into the bark and wood for insects. In Kensington Gardens this species is quite common, where it keeps mainly about the highest limbs of the lofty trees; the loud tappings

of its carpentry may be frequently heard, though a fair sight of its person is difficult to be obtained, as it dodges from side to side of the trunk or branch on which it happens to be, when an observer is near, with much cunning and address, taking care to keep on the farthest side. It does not confine itself, however, to the tall trees, for it occasionally alights on decayed pollards, as well as on the rails and posts of fences, where in the accumulated moss and lichen, or in the various holes and crevices, it finds a rich harvest of spiders, ants, small beetles, caterpillars, and other insects; while in the summer season it varies its bill of fare by stealing cherries, plums, and other fruit from the gardens. Bechstein asserts that it feeds also on oak and beech mast, nuts, and the seeds of the fir tree: and in confinement, on meat. In this country it is not, as far as we know, often kept as a cage bird, but the English translator of Bechstein gives the following interesting account of a Middle Spotted Woodpecker (*Picus medius*, Linn.), a species very near akin to this:—"I have seen a Woodpecker of this species, which was reared by a lady, to whom it seemed very much attached. It had learned of itself to go and return, knocking hard at the window if it was shut out. It was very amusing to see it climbing nimbly over its mistress till it had reached her mouth; it then asked her by light strokes of its beak for the food which she was accustomed to give it; this was generally a little meat. It disappeared one day, without any one's knowing what accident had befallen it."

In the last edition of Pennant's "British Zoology," it is stated that this species, by putting

the point of its beak into a crack of the limb of a large tree, and making a quick tremulous motion with its head, occasions a sound as if the tree were splitting, which alarms the insects, and induces them to quit their recesses: this it repeats every minute or two for half an hour, and will then fly to another tree, generally fixing itself near the top for the same purpose. The noise may be distinctly heard for half a mile. This bird will also keep its head in very quick motion while moving about the tree for food, jarring the bark, and shaking it, at the time it is seeking for insects.

Like the rest of this Family, the Spotted Woodpecker inhabits holes which it has chiselled out of the solid timber of trees; and in these warm, and weather-tight chambers, the females perform the business of incubation. Colonel Montagu relates the following instance of the pertinacity with which the bird remains in her domicile while sitting:—"It was with difficulty the bird was made to quit her eggs; for, notwithstanding a chisel and mallet were used to enlarge the hole, she did not attempt to fly out till the hand was introduced, when she quitted the tree at another opening. The eggs were five in number, perfectly white and glossy."

Family IV. Cuculidæ.

(*Cuckoos.*)

"So faintly," observes Mr. Swainson, "is the scansorial structure indicated in these birds, that but for their natural habits, joined to the position

of their toes, we should not suspect they were so intimately connected with the more typical groups of the tribe as they undoubtedly are. They neither use their bill for climbing, like the Parrots, nor for making holes in trees, like the Woodpeckers; neither can they mount the perpendicular stems like the *Certhiadæ* or Creepers; and yet they decidedly climb, although in a manner peculiar to themselves. Having frequently seen different species of the Brazilian Cuckoos in their native forests, I may safely affirm that they climb in all other directions than that of the perpendicular. Their flight is so feeble from the extreme shortness of their wings, that it is evidently performed with difficulty, and it is never exercised but to convey them from one tree to another, and these flights in the thickly wooded tracts of tropical America are of course very short; they alight upon the highest boughs, and immediately begin to explore the horizontal and slanting ramifications with the greatest assiduity, threading the most tangled mazes, and leaving none unexamined. All soft insects inhabiting such situations lying in their route become their prey, and the quantities that are thus destroyed must be very great. In passing from one bough to another they simply hop, without using their wings, and their motions are so quick, that an unpractised observer, even if placed immediately beneath the tree, would soon lose sight of the bird. The Brazilian hunters give to their Cuckoos the general name of *Cat's-tail;* nor is the epithet inappropriate, for their long hanging tails, no less than their mode of climbing the branches, give them some distant resemblance to that quadruped. I have no doubt that the great

length of tail possessed by nearly all the Cuckoos is given to them as a sort of balance, just as a rope-dancer, with such an instrument in his hands, preserves his footing when otherwise he would assuredly fall. Remote therefore as the Cuckoos unquestionably are from the typical *Scansores*, we yet find the functions of the tail contributing to that office [*i. e.* climbing], although in a very different mode to that which it performs among the Woodpeckers, the Parrots, and the Creepers. The structure of the feet, as before observed, is the only circumstance which would lead an ornithologist to place these birds among the Climbers, supposing he were entirely unacquainted with their natural history properly so called, or with their close affinity to the more perfect *Scansores*. The toes, indeed, are placed in pairs; that is, two directed forward, and two apparently backward; but a closer inspection will shew that the latter are not strictly posterior, and that they differ so very materially from those of the *Picidæ* (the pre-eminently typical Family of the Climbers), as clearly to indicate a different use. The organization of the external posterior toe of all the Woodpeckers, Parrots, and Toucans renders it incapable of being brought forward, even in the slightest degree; whereas, in the Cuckoos, this toe can be made to form a right angle with that which is next it in front, from which circumstance it has been termed versatile; this term, however, is not strictly correct, inasmuch as the toe cannot be brought more than half-way forward, although it can be placed entirely backward. . . . The Cuckoos, in fact, are half perching, half climbing birds, not only in their feet, but, as we have seen,

in their manners. No one, from seeing them alive, would suppose they were truly scansorial birds; and yet it is highly probable that this singular power of varying the position of one of their toes, gives them that quickness of motion and firmness of holding, which accompanies the habit just mentioned."*

The technical characters of the Family, besides those already spoken of, are a beak of medium length, rather deeply cleft, both mandibles compressed and more or less curved downward; the nostrils exposed; wings for the most part short, but the tail lengthened. Their skin is remarkably thin, but the plumage, especially on the back and rump, thick and compact.

The intertropical regions, both of the Old and the New World, afford the greatest number of species to this Family; many, indeed, penetrate into the temperate zones, but it is only as summer visitants, the greater number retiring almost before the heat of the season has sensibly abated. Their food consists largely of insects, principally those which are soft-bodied, as spiders, moths, and caterpillars, varied in many cases with berries and other fruits; and some of the large species will occasionally prey on mice, reptiles, and the eggs and young of birds. Their voices are generally loud and croaking; often consisting of a repetition of a single note in long succession. Their plumage is generally of subdued, but chaste and pleasing hues, with more or less of reflected lustre; the long tail is often graduated, and handsomely barred with black and white. Africa and the islands of the Indian Ocean produce some small

* Mag. of Zool. and Bot. 1837.

species, the plumage of which is radiant with emerald-green, purple, and bronzed reflections.

Genus *Cuculus*. (Linn.)

Of this extensive genus the distinctive characteristics are the following: the beak is broad and rather depressed at the base, with the *culmen* curved, and the sides compressed towards the tip, which is entire and acute; the nostrils are placed on each side of the base, in a short, broad, membranous groove, with the opening round and exposed; the wings comparatively long and pointed, the third quill longest; the tail long, usually graduated, the outmost feather on each side much shorter than the rest; the *tarsi* are very short, feathered below the heel, the exposed part covered with broad scales.

The species are confined to the eastern hemisphere, over the warmer parts of which they are extensively and numerously distributed: two only occur in Europe, the one as a constant, the other as an occasional summer migrant from the sunny regions of Africa: most of the species, indeed, are more or less migratory. Their habits are recluse and solitary, frequenting woods, or at least places where thick trees abound; and they are wary and jealous of the approach of man. They do not fly with much apparent power, but content themselves, in common, with gliding on steady wing from one tree to another. At the season of migration, of course, they must be able to sustain a flight protracted for many leagues. The food of these birds consists largely of caterpillars, especially the thick hairy larvæ of the greater

moths; before swallowing them, the Cuckoo is said to cut off the hinder extremity of the body with its beak, and by repeated jerks to free the insect from the intestinal canal. The note is loud, and uttered frequently in a lengthened and melancholy manner, especially early in the morning, and at the approach of evening; sometimes it is emitted even in the night.

The most remarkable circumstance in the economy of this genus,—and one which, as far as is yet known, is common to the whole of its numerous and widely-spread species,—is that the female makes no nest for its own economy, but deposits its eggs in the nests of small birds, always selecting such as are insectivorous, and for the most part such as belong to the *Dentirostral* tribe. The whole care of hatching and rearing the young, is now left to the foster-parent; and as the wants of so large an intruder, additional to those of their own offspring, would be more than the efforts of the selected nurses could supply, an instinct is implanted in the young Cuckoo, by which, even from the very day of its birth, it is impelled to eject from the nest the rightful tenants of it. This, in the case of our well-known Common Cuckoo (*Cuculus canorus*, LINN.), —whose habits are better known than those of others,—is effected by the newly-hatched Cuckoo insinuating the hinder part of its body under the young of the foster-parent, and raising it upon its loins, which are remarkably broad, and even hollowed, when, lifting it to the rim of the nest, it deliberately throws it overboard; nor does it cease until it finds itself the sole occupant of the nest, and the sole recipient of the attentions of

those whose children it has thus ruthlessly murdered. In this country the Hedge Sparrow, the Pied Wagtail, the Pipit, and the Robin, are the species most frequently chosen by the Cuckoo to be the nurses of her offspring; and it must be

CUCKOO.

confessed, that, notwithstanding the destruction of their own callow brood, the charge is responded to with the utmost assiduity and tenderness.

The periods of the Cuckoo's arrival and departure, and some other particulars in its calendar, are recorded in the following rustic rhymes, probably of considerable antiquity, which we have

met with, and which in a slightly different version are given by Mr. Yarrell:—

In April—Come he will;
In May—He sing all the day;
In June—He change his tune;
In July—Away he fly;
In August—Away he must.

The double note of the male Cuckoo is known to every one; and there are few, in any degree familiar with rural sounds and associations, who do not feel a thrill of pleasure when it falls upon their ear. But more especially when, for the first time in the season, it is heard in a lovely Spring morning, mellowed by distance, borne softly from some thick tree, whose tender, and yellow-green leaves, but half-opened, are as yet barely sufficient to afford the welcome stranger the concealment he loves. At such a time it is peculiarly grateful; for it seems to assure us that, indeed, "the winter is past, the rain is over and gone; the flowers appear on the earth, and the time of the singing of birds is come."

"Sweet bird! thy bower is ever green,
Thy sky is ever clear;
Thou hast no sorrow in thy song,
No winter in thy year!"

The Cuckoo is a bird of much elegance: the plumage of the superior parts is of a chaste bluish-grey tint; the under parts are white, marked on the belly with transverse bars of grey.

ORDER IV. GYRATORES.

(*Circling Birds.*)

While some naturalists, following Linnæus, have considered the great group of birds well known under the names of Pigeons and Doves, as constituting a Family of the extensive Passerine Order, and others, with the illustrious Cuvier, have placed them in that of the Gallinaceous or Poultry-like birds,—others, of equally high consideration, prefer to elevate them to the rank of an Order of themselves. Like the *Passeres* in general, the Pigeons associate in pairs at the season of courtship, the male and female working conjointly to form the nest, taking their turns in the wearying labours of incubation, and participating in the care of the young; the latter, also, are hatched blind and naked, are fed in the nest until they are fledged, and are sustained by the parents even some time after they have quitted it, having no power to feed themselves.

On the other hand, they differ from the *Passeres* in their mode of drinking, and of feeding their young, in the character of their plumage, in the singular tenderness of their courtship, and in the hollow and inward character of their voice.

With the Gallinaceous tribes they have also many points in common. In the peculiarities of their internal anatomy they are closely assimilated

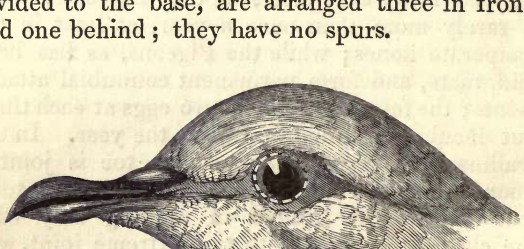
to these; their feet, though formed on the Passerine type, yet allow them to walk with ease and freedom; and many of the species habitually spend their time on the ground, perching very little; the gait and manners of some species are closely like those of the Poultry, and there is a sensible approximation to the latter in the tones of their peculiar voice. But, the differences are more important than the agreements of these groups: the Gallinaceous birds in general do not pair, but each male associates with many females; they lay many eggs each time they incubate, which is rarely more than once a year, at least in the temperate zones; while the Pigeons, as has been said, mate, and form permanent connubial attachments; the females lay only two eggs at each time, but incubate frequently during the year. In the Gallinaceous Order the posterior toe is jointed upon the tarsus higher up than the other toes, and touches the ground in walking only with the claw, or at most with the extreme joint, and remains perpendicular when the bird is on the perch. In the Pigeons, the hind toe is articulated at the bottom of the tarsus on the same level as the others, resting on the ground throughout its length, and embracing the branch in perching.

On the whole, then, we adhere to the opinion of those ornithologists who regard the Pigeons as an Order of birds, containing but a single Family.

Family I. Columbadæ.

(*Pigeons.*)

The Pigeons have the beak of moderate length, somewhat slender, swollen towards the tip, which is curved downwards: the base of the upper mandible is covered with a soft skin, inflated on each side, in which the nostrils are pierced. The wings vary in length, and in adaptation to powerful flight. The feet are comparatively short; the toes, divided to the base, are arranged three in front, and one behind; they have no spurs.



HEAD OF PIGEON.

"One part of the internal organization of the Pigeon is worthy of special notice. The crop, in the state which is adapted for ordinary digestion, is thin and membranous, and the internal surface is smooth; but by the time the young are about to be hatched, the whole, except that part which lies on the *trachea* [or wind-pipe] becomes thicker, and puts on a glandular appearance, having its

internal surface very irregular. In this organ it is that the food is elaborated by the parents before it is conveyed to the young; for a milky fluid of a greyish colour is secreted and poured into the crop among the grain or seeds undergoing digestion, and a quality of food suited to the nestling is thus produced. The fluid coagulates with acids and forms curd; and the apparatus forms, among the birds, the nearest approach to the *mammæ* of the *Mammalia*." *

The form of the Pigeons and their motions are graceful and elegant: the head is small in proportion, the body plump and rounded, the plumage full, compact, and smooth. The prevailing hues in the typical genus are various shades of blue and grey, merging into purple on the one hand, and into white on the other; in the Oceanic Pigeons green is the ordinary colour, varied with brilliant yellow. Metallic reflections of great beauty are common in the Family; not generally spread over the whole plumage, but confined to particular parts, and more especially the region of the neck. The expression of the countenance is peculiarly meek and gentle, and the eye large, liquid, and engaging. The voice, though frequently loud, has a soft and mournful character; it is known by the term *cooing*.

The geographical distribution of the Family is very extensive, the form occurring almost every where, except within the frigid zones. The species also are very numerous; and are most abundant in the south-eastern regions of Asia, and the great Oriental Archipelago.

* Penny Cyclop.; Art. COLUMBIDÆ.

Genus *Columba*. (Linn.)

In this, the typical genus, which contains the species common to Europe, the beak is of moderate strength, straight at the base, compressed at the sides, with the tip bent downward: the nostrils nearly linear, covered with a soft, swollen membrane; the *tarsi* short, partly feathered in front; the hind toe rather long; the wings powerful, rather pointed, the second quill longest; the tail nearly even at the extremity.

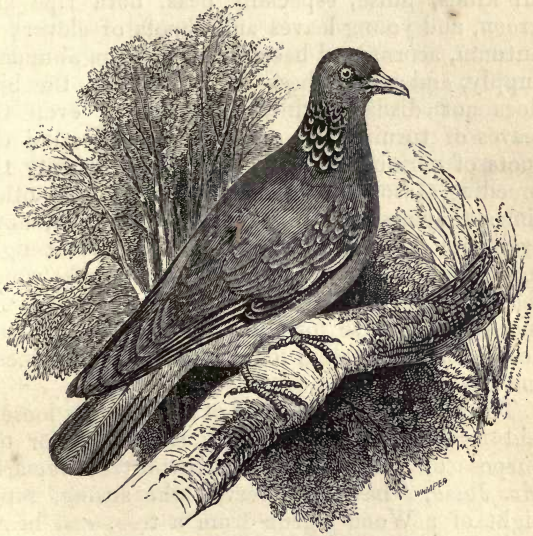
The species of this genus are very numerous, and widely spread over the globe: they commonly breed on tall trees, on the branches of which they construct rude and artless nests of twigs loosely put together, so as to form a slight platform, sometimes without the slightest concavity. Some, however, breed in the holes and on the ledges of rocks.

We select for illustration of the genus, one of the largest of its species, the common Ring-dove, or Wood-pigeon, of our own country (*Columba palumbus*, Linn.), called also, provincially, the Queest and the Cushat.

This fine bird is of a bluish-grey tint on the upper parts, which is darker on the back and wing coverts; the breast is purplish-red, becoming grey on the lower parts; the sides and front of the neck display rich metallic reflections of green and purple; some of the feathers of this part are tipped with white, forming an imperfect ring of white, partly encircling the neck, whence its most common name.

The Ring-dove is a constant resident in the

British Islands, as it is in all the temperate parts of Europe; it affects well wooded districts, being shy and recluse in its habits. Its mournful cooing is heard in such situations almost incessantly during the spring months, though it is rarely seen, except when, the rushing of its powerful



WOOD-PIGEON.

wings directing the attention of the observer to the summit of a lofty tree, he just catches a glimpse of its form as it darts away to some more undisturbed concealment. This shyness of character is, however, sometimes modified. Sir William Jardine mentions an instance in which one

built upon an evergreen overhanging a walk, scarcely a yard above the heads of persons passing; there was a constant thoroughfare, the bird was hourly looked at, and even spoken to, still it persevered in its charge, and seemed to have confidence in being protected.*

The food of the Ring-dove consists of grain of all kinds, pulse, especially peas, both ripe and green, and young leaves and shoots of clover; in autumn, acorns and beech-mast form an abundant supply, and when these are exhausted, the bird does not disdain winter-berries, and even the leaves of turnips and other green-crops, and the roots of various grasses and weeds. During the breeding season they unite in pairs, but at other times they associate in large flocks, which, however they wander during the day, resort at night to a common resting-place, by watching at which they are shot with ease, as the straggling parties successively arrive for the night's repose. Their flesh is in high esteem for its tenderness, juiciness, and flavour.

The nest, consisting only of a few sticks loosely laid across, is yet admirably calculated for the purpose of concealment. "How often," remarks Mr. Jesse, "have I observed the strong, rapid flight of a Wood-pigeon from a tree, and heard the noise produced by his wings, and yet have been unable to discover its nest! This has been owing to the deposits of dead leaves and small branches, which have been accumulated in various parts of the tree, and which have exactly the same appearance as the nest itself." †

* Nat. Lib.; Ornithology, iii. 61. † Gleanings, 76.

ORDER V. GALLINÆ.

(*Poultry.*)

Of all the Orders of birds there is none which is so valuable to man as this; their flesh is tender, sapid, and digestible, and their eggs are in high esteem as human aliment, while from their generally large size, the number of the eggs which they lay, and consequently their rapid increase, the power which they exhibit of accommodating themselves to the vicissitudes of climate, and the facility with which they are domesticated, they may be considered as supplying the place of the *Ruminants* among *Mammalia*.

The characters by which they are distinguished are strong and well-defined. They are all granivorous, feeding on the farinaceous grains, pulse, and seeds, which are cultivated by man for his own sustenance, or upon their wild representatives; though insects are often added to this diet. Their heavy carriage, stout form, small head, and short, rounded, and hollow wings, at once distinguish them from other birds, while their soft and slight breast-bone (*sternum*), so cut away that the horizontal portion is reduced to two narrow strips on each side, its keel obliquely hollowed away in front, and the merrythought-bone (*furcula*) attached to it only by a ligament, are equally distinctive peculiarities in their internal anatomy. And these peculiarities exercise an important in-

fluence on the habits and economy of these birds; for the bones thus diminished are those to which are attached the muscles which agitate the wings, which being necessarily small and weak, flight is feeble and laborious. Hence the Poultry reside chiefly on the ground, or on the low branches of trees; rarely mounting on the wing except to carry themselves beyond the reach of sudden danger, or to elevate themselves to their nocturnal roosting-perch. With the exception of a few species, they perform the business of incubation on the ground, laying their numerous eggs in a hollow slightly scratched in the earth, or at most on a few carelessly accumulated sticks, or straws.

Very many of the species are richly coloured; and some are adorned with metallic reflections of the most refulgent splendour. In general, the male is larger and more gaily coloured than the female; and he is frequently distinguished by some peculiar development of the tail or its coverts. The tail in this Order has more than the ordinary number of feathers, having from fourteen to eighteen. The species, though inoffensive towards other animals, are irritable and pugnacious between themselves; the males of several species fighting with a determined pertinacity that frequently yields only to death.

The Poultry are chiefly found in the continents; the islands, unless very large, or in the vicinity of a continent, being comparatively destitute of them. The south and east of Asia, and the deep forests and glades of America, produce the greatest number of species, as well as the most remarkable for size and beauty.

Six Families are included in this Order, viz., *Cracidæ*, *Megapodidæ*, *Phasianidæ*, *Tetraonidæ*, *Chionididæ*, and *Tinamidæ*.

Family I. Cracidæ.

(*Curassows.*)

In these large fowls of South America, which somewhat resemble the Turkeys, we find an exception to one important character of the Gallinaceous Order, which indicates a connexion with the Passerine birds. The hind toe is articulated on the same plane as the others, touching the ground in its whole length when walking, and thus the foot is constructed on the type of that of the Perchers. In conformity with such a structure, these birds possess habits much more arboreal than the other Poultry-birds, spending a great deal of their time on the trees of the dense forests in which they reside, forming their nests among their branches, and feeding on their buds and fruit. The curved form of the claws, their compressed sides, and their acute points, afford additional indications that these birds are not habitually employed in walking and scratching the ground. The tarsi, too, are destitute of spurs. In other particulars, however, these birds adhere to the distinctive characters of the Order.

The Curassows are some of the most valuable additions that America has made to our domestic Poultry, though they are as yet but partially introduced into England. One of the objects of the formation of the Zoological Society of London, was the introduction and domestication of

useful foreign animals, and among these it has devoted especial attention to the *Cracidæ*. Soon after the formation of its menagerie, its late esteemed Secretary, Mr. Bennett, thus wrote:—"Of all the Gallinaceous birds in the collection, the most interesting are those which hold out to us a prospect of supplying our farm-yards with new breeds of Poultry of a superior kind. Such are especially the Curassows. In many parts of South America these birds have long been reclaimed; and it is really surprising, considering the extreme familiarity of their manners, and the facility with which they appear to pass from a state of nature to the tameness of domestic fowls, that they have not yet been introduced into the poultry-yards of Europe. That with proper treatment they would speedily become habituated to the climate, we have no reason to doubt; on the contrary, numerous examples have shewn that they thrive well even in its northern parts; and M. Temminck informs us, that they have once at least been thoroughly acclimated in Holland, where they were as prolific in their domesticated state as any of our common poultry. The establishment, however, in which this had been effected, was broken up by the civil commotions which followed in the train of the French Revolution, and all the pains which had been bestowed upon the education of these birds, were lost to the world by their sudden and complete dispersion. The task which had at that time been in some measure accomplished still remains to be performed; and it may not be too much to expect that the Zoological Society may be successful in perfecting what was then so well begun, and in naturalizing the

Curassow as completely as our ancestors have done the equally exotic, and, in their wild state, much less familiar, breeds of the Turkey, the Guinea-fowl, and the Peacock. Their introduction would certainly be most desirable, not merely on account of their size and beauty, but also for the whiteness and excellence of their flesh, which is said by those who have eaten of it to surpass that of the Guinea-fowl or of the Pheasant in the delicacy of its flavour." *

Genus *Crax*. (Linn.)

The beak in the genus before us, is of moderate length, very high at the base, thick, keeled above, curving downward to the point; the base surrounded by a membrane, sometimes brightly coloured, in which the nostrils are pierced. The space between the beak and the eyes is naked; the head is covered with a crest of long erected feathers, which are singularly curled over at their tips. The tail, which consists of fourteen feathers, is broad, spread out, and inclined downwards. The wings are short, the sixth quill the longest.

The common Crested Curassow (*Crax alector*, Linn.) is a native of Mexico, Guiana, and Brazil. In the forests of Guiana, M. Sonnini speaks of it as so abundant as to form an unfailing resource of the traveller who has to trust to his gun for a supply of food. They are described as congregating in numerous flocks, allowing the intrusion of man without much alarm. In the neighbourhood of cultivated districts they have learned distrust by experience. It is proper to observe, however,

* Gardens and Menag. ii.

that in Brazil, Mr. Swainson was not so fortunate as to meet with a single specimen, though he occasionally heard of one being seen; and he adds

CRESTED CURASSOW.

that in Guiana, it appears to have become rare, for in a collection of many hundreds [of birds] made in that country by Mr. Schomburgk, there were not three species of the whole genus.*

The nest of this bird is built on trees, of branches interlaced with the stalks of herbaceous plants, internally lined with leaves. It lays but once a year, during the rainy season, when six or eight eggs are deposited, as large as those of a Turkey, but white like those of a Hen, and with

* Anim. in Menageries, 179.

a thicker shell. The plumage of the Crested Curassow is of a deep glossy black, but the lower belly is white; the naked skin of the face and the cere are bright yellow. The curled tips of the crown-feathers, look like a great number of little velvety globules.

Family II. Megapodidæ.

The present Family, scattered over the continent of Australia, and the easternmost islands of the great Indian Archipelago, even to the Philippines, is peculiarly interesting because of its very remarkable domestic economy recently investigated by Mr. Gould. The details, in one species, we shall presently describe.

The beak is vaulted, somewhat compressed; the wings are short and rounded; the tail is short, varying in the number of its feathers from twelve to eighteen; the feet are of disproportionate size and strength; the tarsi being stout, elevated, and strongly scaled; the toes long and robust, and armed with strong, flat, rasorial claws.

The flesh of these singular birds is white, and highly esteemed for its tenderness and flavour. The eggs are of enormous size as compared with those of other birds.

Genus *Megapodius*. (Less.)

The beak of the Megapodes is slender, nearly straight, and somewhat like that of a fowl; the nostrils placed at the end of a groove reaching beyond the middle, the groove covered with a

membrane clothed with small feathers. The head and neck are well feathered, except a naked space around the eye. The feet are large and strong, placed far backwards; the tarsus large, long, and covered with large scales; the hind toe resting wholly on the ground; the claws are very long and robust, flattened above, little curved, blunt at the point. The wings are rounded and hollow; the tail small, wedge-shaped; composed of twelve feathers.

The most interesting species known is that called by the colonists at Port Essington in North Australia, the Jungle-fowl (*Megapodius tumulus*, Gould), which is about as large as a common fowl. Its upper parts are of a bright red-brown; the tail blackish; the under parts dark grey; the head is furnished with a long recumbent crest. It is known to be spread over the Cobourg Peninsula, and will probably be found to range over the whole northern region of the Australian continent.

It is to the researches of Mr. John Gilbert that we are indebted for our knowledge of this singular bird's economy. On his arrival at Port Essington many great mounds of earth were pointed out to him, which were supposed by the colonists to be tumuli of the aborigines, but which the natives asserted to be formed by the Jungle-fowl, for the purpose of hatching its eggs. To ascertain the truth, Mr. Gilbert accompanied an intelligent native to an unfrequented spot of the coast, where he soon found a mound on the beach, composed of sand and shells, of a conical form, twenty feet in circumference at the base, and about five feet high. The native asserted

that this was "Jungle-fowl's house." Mr. Gilbert having scrambled up the side of it, found in a hole, two feet deep, a young bird, apparently only a few days old, lying on some dry leaves. The native decided, from the absence of recent traces of the old birds, that it was useless to search for eggs. The young bird was put into a box, with a quantity of sand and some Indian corn, which it ate freely. Its disposition was wild and intractable, and it was incessantly employed in scratching up the sand into heaps, and throwing it from one end of the box to another with a surprising rapidity for so small a bird. In scratching, the bird employed only one foot, and having grasped a handful, as it were, threw it behind with little apparent exertion, and without shifting its standing position on the other leg, an action which seemed to have little connexion with its feeding; for though the corn was mixed with the sand, Mr. Gilbert never detected the bird in picking up any while thus engaged. At night it was so restless and noisy, that it was impossible to sleep, making efforts to escape, which, on the third day, it effected.

Some months after this Mr. Gilbert saw two eggs taken from a depth of six feet, in one of the largest mounds he had met with. The holes ran obliquely downwards, so that, though the eggs were six feet from the summit, they were not more than two or three feet distant from the side. A single egg is laid in each hole, which is then filled with earth lightly thrown in, and smoothed at the top. To reach the eggs requires no little exertion and perseverance; the natives dig them up with the hands alone, making only sufficient

room to admit their bodies, and to throw out the earth between their legs. In the present instance the native dug down six times in succession to a depth of six or seven feet, without finding an egg, and at the last attempt came up so exhausted that

MOUND-RAISING MEGAPODIUS.

he refused to try any more; induced, however, by promised reward, he made a seventh attempt, and to the gratification of his employer, and not less to his own pride and satisfaction, held up an egg, and after a few more exertions, a second: thus proving, observes Mr. Gilbert, how cautious Europeans should be of disregarding the narrations of these poor children of nature.

On another occasion an egg was obtained, after an hour's arduous labour, from a mound fifteen feet high, and sixty feet in circumference. As usual, it was so enveloped in dense trees, as to exclude the rays of the sun from its surface; yet its interior felt quite warm. The egg is nearly as large as that of a swan; it is white, but tinged by the soil of a dingy brown hue.

The Jungle-fowl seems to be confined to the thickets near the sea. It is always seen in pairs or singly; its food consists of roots, which it scratches up with great facility, and of seeds, berries, and large beetles. It flies heavily and awkwardly, with much whirring of its hollow wings. The native's imitation of its note was like the clucking of the domestic fowl, ending with a scream like that of the peacock.*

Family III. Phasianidæ.

(*Pheasants.*)

The extensive Family at which we are now arrived contains birds of large size, imposing aspect, and magnificent plumage; and as the flesh of all is in good esteem, it is the most important of all to man. Some of its members have been kept in a state of domestication for so long a period that history and tradition have both failed to fix its commencement: thus the earliest Greek poets recognise the common Fowl and the Peacock as well known birds, whose introduction was unrecorded; while the European possession of the Pheasant is carried by them back to a fabulous

* Gould's Birds of Australia.

period, and enveloped in the mists of twelve centuries before the Christian era.

The beak in the *Phasianidæ* is arched, and the nostril is covered with a vaulted, smooth, naked, horny scale. The wings are short, rounded, and hollow beneath; incapable of rapid or long-sustained flight. The feet are large and powerful; the tarsus naked, covered in front with large scales or plates, and furnished with one or more curved and pointed spurs; the hind toe is placed higher up on the tarsus than the three front ones, so that in walking, its tip alone touches the surface; the claws are slightly curved, and obtuse at the point. The tail consists of eighteen feathers, which in all are well developed either in breadth or length, and in some extraordinarily; in some cases those of each side are set in different planes, so that the tail folds upon itself perpendicularly, the undersides of the right feathers meeting those of the left. In other or the same genera, the tail-coverts are greatly lengthened. The males generally are of superior size and magnificence to the females; and many shine in the most rich, though not usually showy hues, and reflect the gorgeous refulgence of precious stones, or polished metal. In most cases some part of the skin of the face is naked and brightly coloured, and many are ornamented with wattles, combs, or feathery crests, most conspicuous in the male sex.

The torrid regions of Southern and Eastern Asia yield the greatest number of species, and those the most gorgeous; but one genus, that of the Guinea-fowl, is peculiar to Africa, and one, that of the Turkeys, to America.

Genus *Pavo*. (Linn.)

This noble fowl, though not a native of this country, has been domesticated with us so long as to be familiar to all our readers. The genus, which contains but two recognised species, is distinguished by the following characters: the beak is convex, rather stout, curved towards the tip, smooth at the base; the cheeks partially naked; the nostrils, situated at the base of the beak, are open; the head surmounted with an erect crest of slender, peculiarly formed feathers; the wings are short, the sixth quill the longest; the tail-coverts very long, broad, and erectile, in the male.

The Common Peacock (*Pavo cristatus*, Linn.) is mentioned as known in Greece in very early times; Eupolis and Athenæus, who flourished in the fifth century before Christ, speak of it; and even five centuries farther back, it was regularly imported into Judea from the east in the fleets of Solomon:-while, at an era still more remote, its beauty is appealed to, as a thing commonly known on the southern border of the same country.*

It seems scarcely necessary to describe a bird so familiarly known; to dilate upon its light coronet of lance-tipped feathers, its taper neck, and swelling breast of changeable purple, its back and wings of brassy-green, or its superb lengthened tail-coverts, with their dilated tips marked with eye-spots of the richest purple, surrounded by rings of green, black, and chestnut, radiant with gem-like reflections. These feathers do not constitute the tail, for they begin to grow far up on the back, so that when erected and spread,

* Job xxxix. 13.

scarcely more than the head and neck of the bird appear in front of them. The true tail is situated beneath, and is commonly concealed by these,

PEACOCK.

consisting of eighteen brown, stiff feathers about six inches long.

Immense flocks of these splendid birds in a wild state exist in the forests of India and the

great adjacent islands: and these have been ascertained to be specifically identical with our domestic races. Colonel Sykes describes the species as abundant in the dense woods of the Ghauts; it is readily domesticated, and many Hindoo temples in the Deccan, as he informs us, have considerable flocks of them.

Colonel Williamson also, in his account of Peacock-shooting, states that he had seen about the passes in the Jungletery District, surprising numbers of wild Pea-fowl. He speaks with admiration of the whole woods being covered with their beautiful plumage, to which the rising sun imparted additional brilliancy. Small patches of plain among the long grass, most of them cultivated, and with mustard then in bloom, which induced the birds to feed, increased the beauty of the scene. "I speak within bounds," observes the Colonel, "when I assert that there could not be less than twelve or fifteen hundred Pea-fowls, of various sizes, within sight of the spot where I stood for near an hour."

From the same respectable authority we learn that it is easy to get a shot at these fine birds in the jungle, but where they flock together, as they do to the number of forty or fifty, there is greater difficulty. Then they are not easily flushed, and run very fast; so fast, indeed, that the Colonel doubts whether a slow spaniel could make them take wing. Their flight is heavy and strong, generally within an easy shot; if merely winged, they frequently escape by swiftness of foot. They roost on high trees, into which they fly towards dusk.

The flesh of the Peacock, when not old, is

juicy and savoury, and though not often eaten now, was in former times an important addition to great banquets. It was served up by the sewer with much ceremony, dressed in its own brilliant plumage. The adventurous knight of the days of chivalry was accustomed to make his solemn vows, "before the Peacock and the Ladies."

Family IV. Tetraonidæ.

(*Grouse.*)

The groups which form this extensive Family are distinguished from the *Phasianidæ* by their more simple appearance; by the absence of the naked crests and wattles that are so common among the last-named birds, as well as of the brilliant colours and metallic lustre of their plumage. In the Grouse we find no naked skin about the head, with the exception of the space which surrounds the eye; this, when present, is of a scarlet hue. The tail is in general very short, and in some genera only rudimentary; yet there are species, as the larger Grouse of Europe and America, and the Pintails of Africa, which manifest a tendency to the great development of this organ, which is so characteristic of the Pheasants. The hind toe which in the last-named Family is long and powerful, is in that before us small and weak, and in the extreme genera reduced to a rudiment; thus preparing us for the birds of the succeeding Family, in which it is altogether wanting.

Though some genera of the *Tetraonidæ* are

found in the warmer regions of the earth, yet the majority of them, and those the most typical of the group, are natives of the cold regions of the north hemisphere, or of the summits of alpine ranges of mountains. Many of these are protected from the cold by having the feet more or less clothed with feathers, in some extending even to the extremities of the toes.

The Grouse in general depart from the polygamous habits of their Order; pairing at the breeding season, and remaining in associations, each composed of a single brood, for the rest of the year; there are several species, however, which do not pair. During winter they congregate in large flocks, without distinction of broods, and continue thus assembled till the nuptial season. In most of the genera, there is a nuptial change of plumage, more or less obvious, and in those of very cold countries, there is a state of plumage peculiar to the winter season. They all breed on the ground, and with few exceptions lay a great number of eggs at a time: they are terrestrial in their general habits, running with great ease and celerity; some perch on the low stunted trees of cold climates, on the unexpanded leaf-buds of which they largely feed. Various kinds of cultivated grain, and the seeds of grasses, and of leguminous plants afford food to others. The flesh of almost all is highly esteemed for its tenderness and high flavour.

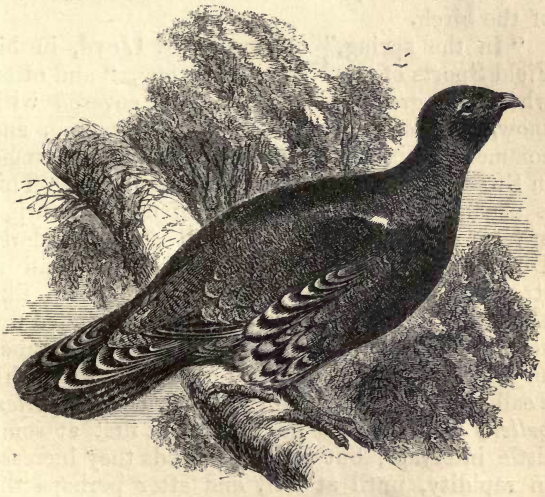
Genus *Tetrao*. (Linn.)

The largest birds of the Family are found in this genus, the Capercailzie of Northern Europe,

and the Cock of the Plains of the Rocky Mountains being scarcely inferior to the Turkey in dimensions. It is thus characterized: the beak is short, very strong, and arched from the base to the tip; the nostrils are situated on each side of the base, partly hidden by an arched scale, and small close-set feathers. A naked skin above the eyes, of a bright scarlet colour; enlarging in spring. Wings short, rounded, and hollow: tail of sixteen feathers, very ample, and expanding. Feet naked, with the edges of the toes toothed; the tarsi feathered.

The dense pine-forest, the wild plain, the mountain and the barren rock, the moorland and the heath, are the resorts of the true Grouse. The northern part of our own Island, in common with the colder regions of Scandinavia and Russia, formerly produced, in considerable abundance, the most magnificent species known, the Capercailzie, or Cock of the Wood (*Tetrao urogallus*, Linn.); but his size, beauty, imposing appearance, and savoury flesh long ago caused his extermination from our woods. The last specimen is recorded to have been killed in Scotland about seventy years ago. By the exertions of some of the Scottish nobility, however, this fine bird seems likely to become again a wild denizen of our northern woods. In particular, Lord Breadalbane procured from Sweden at great expense, in the year 1838 and the early part of 1839, forty-four adult Capercailzie, the majority of which were hens. A portion of these were put into a large aviary, and others turned out into the forest, and we are informed that both divisions succeeded, and that seventy-nine young birds were known to be

hatched out during the season of 1839. By an article published in the Sporting Review, for April, 1840, it appears that the greatest success was obtained by putting the eggs laid in the aviary into the nests of wild Black Grouse. Forty-nine young Capercailzie were by this single method alone known to be hatched in the open country.*



CAPERCAILZIE.

The Capercailzie is about the size of a Turkey: a fine male will sit fully two feet above the branch on which he is perched; Mr. Yarrell gives the length of a specimen as three feet four inches. The general plumage is blackish, minutely freckled

* See Yarrell's Brit. Birds, ii. 331.

with whitish, so as to impart a grey hue; the breast is of a fine dark green; the quills chestnut-red; the tail-coverts, which are lengthened, run down in two series, and are tipped with white; the tail itself is black.

The leaves and young shoots of the Scotch fir, the berries of the juniper, cranberries, &c., with worms and insects, constitute the common food of the Capercailzie; in winter he eats also the buds of the birch.

"In the spring," observes Mr. Lloyd, in his Field Sports of the North of Europe, "and often when the ground is still deeply covered with snow, the cock stations himself on a pine, and commences his love-song, or *play*, as it is termed in Sweden, to attract the hens about him. This is usually from the first dawn of day to sunrise, or from a little after sunset until it is quite dark. During his play the neck of the Capercali is stretched out, his tail is raised and spread like a fan, his wings droop, his feathers are ruffled up, and in short he much resembles in appearance an angry Turkey-cock. He begins his play with a call something resembling the word *peller, peller, peller;* these sounds he repeats at first at some little intervals; but as he proceeds they increase in rapidity, until at last, and after perhaps the lapse of a minute or so, he makes a sort of gulp in his throat, and finishes by drawing in his breath. During the continuance of this latter process, which only lasts a few seconds, the head of the Capercali is thrown up, his eyes are partially closed, and his whole appearance would denote that he is worked up into an agony of passion.

"On hearing the call of the cock, the hens, whose cry in some degree resembles the croak of the Raven, or rather, perhaps, the sound *gock, gock, gock*, assemble from all parts of the surrounding forest. The male bird now descends, from the eminence on which he was perched, to the ground, where he and his female friends join company."

Family V. Chionididæ.

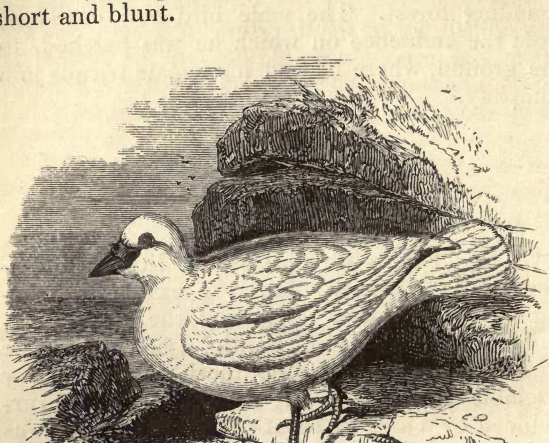
(*Sheath-bills.*)

Of this Family we possess but little information. It is extremely limited in extent, consisting of a few species inhabiting the high mountains or dry plains of South America, or the remotest parts of the Southern Ocean. They resemble the Grouse, but have the nostrils surrounded by a sort of sheath. The typical genus *Chionis* is often found far out at sea, but chiefly inhabits the rocks washed by the tide, feeding on sea-weeds and shells; hence they have been placed by some naturalists with the wading-birds.

Genus *Chionis*. (Forst.)

The beak, in the two species which constitute this genus, is strong, broad at the base, but compressed near the tip, with the *culmen* curving downward; the base is encased in a horny substance, furrowed and notched, which conceals the nostrils. The cheeks are covered with a naked skin. The wings are moderate, the second quill longest, the shoulder armed with a tubercle. The

tail is moderate and even. The tarsi and toes are short and strong, the outer toe united at the base to its fellow by a membrane; the hind toe small, elevated, and placed on one side; the claws are short and blunt.



SHEATH-BILL.

These singular birds of snow-white plumage are found on the dreary and iron-bound shores around Cape Horn, or on the solitary islands and rocks of the Antarctic Ocean. They have been met with by southern voyagers at a great distance from any land, and are supposed to rest and feed on sea-weeds and other refuse matter cast up on the icebergs of those remote seas. They frequent

the shores for the same purposes, searching the beaches and rocks for shelled *mollusca*, chiefly the limpets (*Patella*), on which they principally subsist; they do not reject, however, other animal matters thrown up by the action of the waves, as well as sea-weeds, and these are found in their stomachs, usually mingled with small stones. Their flight is rapid, and resembles that of a Pigeon.

We illustrate the genus by the Small Sheathbill (*Chionis minor*), which is about as large as a Lapwing, of a pure white hue, with red beak and feet.

Family VI. Tinamidæ.

(*Tinamous.*)

The Family of the Tinamous is peculiar to the warmer parts of the world. They are intermediate in form between the Partridges and the Bustards, having the long neck and legs and small feet of the latter, and the nostrils covered with a naked scale, like the Pheasants. The beak varies in length; the wings are short, and the tail and the hind toe rudimentary.* In some the joint of this toe with its claw is just perceptible as a little tubercle; but in others it is altogether lost.

Most of the species, which are indeed extremely few in number, inhabit the immense grassy plains of South America, where they seem to represent the Partridges and Quails of the Old World. With scarcely any tail, and with very thick bodies,

* Synopsis of the Brit. Mus. (1842) p. 37.

their whole appearance reminds the observer of a Bustard in miniature. They are easily caught by a man on horseback, as they exhibit little sagacity in avoiding danger. "As for their flesh," says Mr. Swainson, "we have often tasted it, and consider it both in whiteness and flavour, infinitely above that of the Partridge or Pheasant. We believe these birds never perch, as some suppose, but that they live entirely among herbage, principally in the more open tracts of the interior."

There is, however, one genus found in the sandy regions of the Old World, and which has, at least on one occasion, visited this country. We select this as an illustration of the Family.

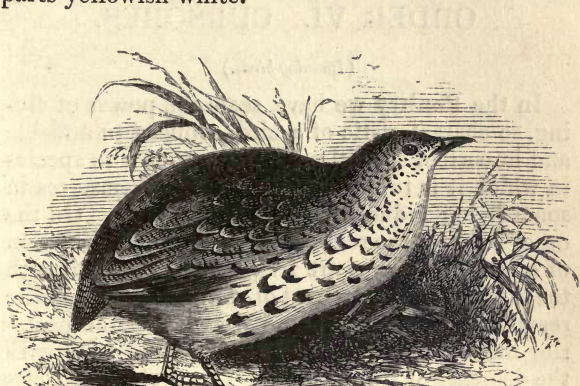
Genus *Turnix*. (Bonn.)

The characters of this genus, as given by Mr. Gould in his magnificent work, "The Birds of Europe," are these: The beak moderate, slender, very compressed; the *culmen* elevated, and curved towards the point. Nostrils lateral, linear, longitudinally cleft, partly closed by a membrane. Tarsus rather long. Toes three before, entirely divided; no posterior toe. Tail composed of weak yielding feathers clustered together, and concealed by the feathers of the back. Wings moderate, the first quill-feather the longest.

The species composing this genus principally inhabit the countries which surround the Indian Ocean, from the Cape of Good Hope to Australia: they run among grass, where also they make their nests; but they fly with ease and rapidity. The males are considerably smaller than the females.

The Andalusian Hemipode (*Turnix tachydro-*

mus, GOULD) is found in Spain, and the northern parts of Africa. It is scarcely larger than a lark; of a yellowish brown hue, variously spotted and barred with chestnut, black, and white; the under parts yellowish white.



ANDALUSIAN TURNIX.

Two specimens of this very rare bird were shot in Oxfordshire, about the end of October, 1844, in a field of barley, some grains of which were found in the stomach, with other seeds. Mr. Gould considers this one of the most interesting additions to British Zoology that has been made for many years.

ORDER VI. CURSORES.

(*Running-birds.*)

In the Poultry we have seen the power of flying, so characteristic of a bird, reduced to a feeble and imperfect condition; we come now to species in which it is totally lost, the wings themselves in some being reduced to mere rudiments. On the other hand, as the reduction and gradual extinction of one set of organs are frequently connected with the increased development of another series, in some respects correspondent, so here we find the posterior limbs increasing in size and muscularity with the decrease of the anterior. The pectoral muscles are small and slender, and the breast-bone (*sternum*) presents an uniform convex surface, like that of a shield, utterly destitute of even the rudiment of the keel, which is so large and prominent in the Swallows, Humming-birds, and other powerful fliers.

The Runners are all large birds, most of them equalling, if not exceeding, the average height and bulk of the *Mammalia*, to which indeed they exhibit a closer approximation than any other of the feathered tribes. The single Family in which they are all included (for the Bustards seem to be more allied to the Waders, and the place of the extinct Dodos is yet doubtful) is almost confined to the Southern Hemisphere, one species alone reaching to the north of Africa and Arabia. They chiefly inhabit immense plains.

Most, if not all, of these birds are remarkable for the peculiarity of their incubation. Many females unite in the occupation of a single nest, in which a great number of eggs are laid, which are sat upon chiefly by the male; who, when disturbed, feigns lameness, an artifice common to birds which nestle on the ground. The hind toe is wanting in all the genera, except the singular *Apteryx* of New Zealand, where it exists in the form of a small rudiment.

Family I. Struthionidæ.

(*Ostriches.*)

The Ostriches are birds of gigantic size, with the neck and legs greatly developed in length. Their plumage is peculiarly lax and flexible, the barbs being decomposed, very fine, weak, and permanently separate, instead of hooking into one another in that manner which gives so much firmness to an ordinary feather. The elegance of the soft, broad, and gracefully curved plumes of an Ostrich's wing and tail is well known and universally admired. In some genera, the barbs of the feathers are so slight, that the plumage resembles coarse hair. The wings are small, or rudimentary; the thighs remarkably stout and muscular; the leg and tarsus are very long; the toes are three, or in one genus only two, and in the latter case, but one is furnished with a nail somewhat resembling a hoof. The beak is rather short, and horizontally flattened, the tip rounded; the tongue is short and of a crescent form; the eye is large and full, and the lids are furnished with long lashes.

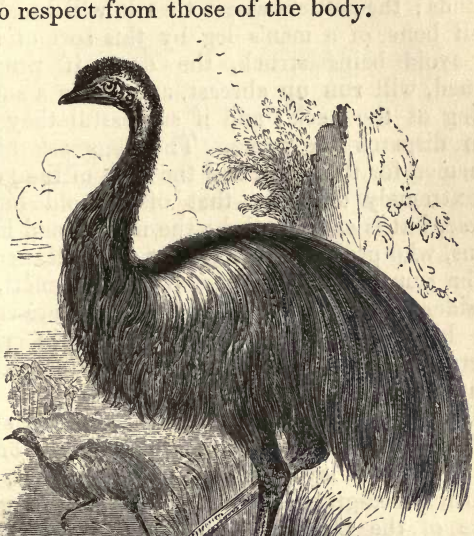
The various species, which are not numerous, inhabit the vast plains of Africa, South America, Australia, and the great islands of the Oriental Archipelago. One singular form is confined to New Zealand. They mostly associate in flocks, and subsist on grain, fruits, and herbage, to which worms, insects, and other animal substances, are sometimes added. Some of them are able to swim with facility, though the toes are not webbed. They are birds of imposing appearance, but though watchful and suspicious, possess but little intelligence.

Genus *Dromaius*. (Vieill.)

In this Australian form of the *Struthionidæ*, the beak is straight, with the edges very much depressed, rounded at the tip, and slightly keeled along the ridge. The nostrils are large, protected by a membrane, opening about the middle of the upper part of the beak. The head is feathered; the throat nearly naked. The feet have three toes armed with blunt, hoof-like claws.

The Emu of New South Wales and Southern Australia (*Dromaius Novæ-Hollandiæ*, Lath.) is now well known to us by the numerous specimens which have been sent to this country, some of which have bred in our menageries. In size and height it nearly equals the African Ostrich, for the males are said to attain a stature of above seven feet, and some of the specimens in captivity are but little inferior to this. The hair-like plumage divides along the line of the back, and falls gracefully over on each side; it is generally of a dusky brown, mottled on the under parts with

grey. The feathers are all double, two springing from the same shaft. The wings are invisible when closed, being covered with feathers differing in no respect from those of the body.



EMU.

The chase of the Emu is a favourite amusement with the colonists of New South Wales. It is, however, not unattended with danger. We learn from Mr. Cunningham, that few dogs, except such as are specially trained, can be brought to attack it, both on account of some peculiar odour in the

flesh which they dislike, and because, when driven to extremity, it defends itself with great vigour, striking out with its feet, and inflicting terrible wounds; the settlers assert that it will break the small bone of a man's leg by this sort of kick. To avoid being struck, the dogs, if properly trained, will run up abreast, and make a sudden spring at the neck; and if successful they then soon dispatch the game. The eggs are highly esteemed for the table, and the flesh of the young is extremely delicate; that of the old bird is coarse, but is eaten both by the natives and Europeans, who prefer it even to that of the Kangaroo. "The rump part," says Mr. George Bennett, "is considered as delicate as fowl: the legs are coarse like beef, but still tender." The skin yields several quarts of clear oil, which is valued for many purposes.

The nest of the Emu consists of a few sticks and leaves, scraped together among the brush-wood: here it lays from six to eleven eggs, of a beautiful sea-green hue, and nearly as large as those of the Ostrich. During the season they form a large means of subsistence to the natives.

Emus go in large flocks upon the extensive downs, where they feed upon leaves, fruits, and herbage. They swim well, crossing rivers with ease: on land they are very fleet. The voice of these birds is a hollow, inward, drumming sound, produced by a peculiar structure of the windpipe. There is no doubt that they might readily become naturalized in England.

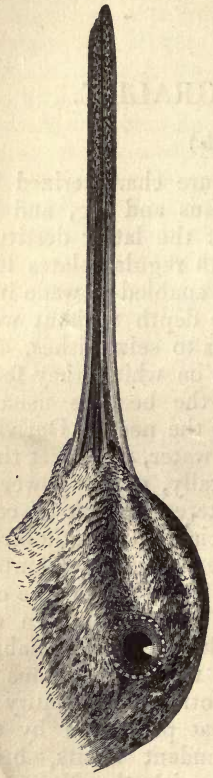
ORDER VII. GRALLÆ.

(*Wading-birds.*)

The birds of this Order are characterized by the great length of the tarsus and leg, and by having the lower portion of the latter destitute of feathers, and covered with regular plates like the former. They are thus enabled to wade into the water to a considerable depth without wetting their plumage; and thus to seize fishes, and other animals of the waters, on which they feed. To facilitate this object, the beak is usually greatly lengthened, as is also the neck. Deriving thus their support from the water, while yet they are destitute, at least generally, of the power of swimming, they form an interesting link of connection between the terrestrial and aquatic birds. The typical Families alone, however, maintain this intermediate character; for while on the one hand, the Plovers and the Cranes, both in the nature of their food and in their terrestrial habits, conform rather to some of the Gallinaceous or Cursorial groups,—on the other, the faculty of swimming possessed in great perfection by the Rails, with their correspondent habits, bring them into close association with the Natatorial type.

The wings of the Waders are usually long and powerful; and hence the flight of these birds is rapid and well sustained: many of them make

periodical migrations, and are thus widely distributed over the globe. They commonly stretch out their long legs behind the body during flight, thus maintaining their balance, which otherwise, from the extreme shortness of their tails, might be difficult. Those genera which are most aquatic place their nests among the reeds and herbage of marshy places, or, as the Herons, build in society on trees; those which frequent dry and stony places, frequently lay their eggs on the bare ground, or content themselves with such protection as a tuft of grass may afford. The eggs are usually marked with spots on a coloured ground; they are commonly of a lengthened form, with one end much pointed.



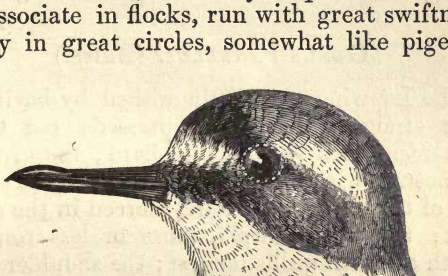
HEAD OF SNIPE.

The Order is very extensive, and comprises the following five Families: — *Charadriadæ*, *Ardeadæ*, *Scolopacidæ*, *Palamedeadæ*, and *Rallidæ*.

Family I. Charadriadæ.

(*Plovers.*)

In this extensive group the feet are long and slender, adapted for swift running; the toes comparatively short, and the hind one either wanting, or in the few cases where present, so small as to be little more than rudimentary; the wings are long and pointed, and the flight rapid and powerful. Plovers live chiefly on sandy and unsheltered shores, or on dry, exposed commons; they associate in flocks, run with great swiftness, and fly in great circles, somewhat like pigeons,



HEAD OF PLOVER.

wheeling round at no great height, with loud piping cries. Their head is thick, with large dark eyes, placed far back; the beak is short, the basal half soft and compressed, the outer half abruptly swollen, and often slightly notched, so as to pre-

sent some resemblance to that of a Pigeon. The nostrils are pierced in a long groove.

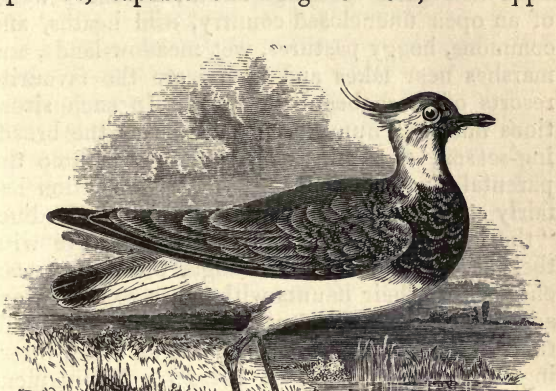
The colours of the Plovers are not showy, but are chaste and beautiful: various shades of brown, mingled with ochraceous tints, and diversified with white and black, frequently disposed in bands, may be considered as most prevalent among them. The plumage is generally subject to periodical changes; a gayer and more varied dress being assumed for the nuptial season, than that displayed in winter. Many of them are active during the night; they feed on worms, slugs, &c. The species are scattered over the whole globe.

Genus *Vanellus*. (Briss.)

The Lapwings are distinguished by having the beak straight, slightly compressed; the tips of both mandibles smooth and hard; the groove of the nostrils wide, deep, and reaching to the swollen part of the beak; the nostril pierced in the middle of it; the wings ample, more or less rounded; fourth and fifth quills longest; the shoulder armed with a spur; the feet slender, the tarsal plates taking a net-work form; the toes united at the base by a small membrane; a minute hind toe, jointed on the tarsus. They inhabit the Old World; breed inland; associate in flocks, which are very clamorous when their haunts are approached in the breeding season. At the approach of winter they migrate to the seaside, when they appear in a different condition of plumage.

The common Lapwing or Peewit (*Vanellus cristatus*, Meyer) is one of the most beautiful of the Plovers. In its nuptial plumage, the crown,

face, neck, and breast are of a deep and rich black, with a green gloss; from the hind head springs a most elegant crest of long black feathers, curving upwards, capable of being erected; the upper



LAPWING.

parts of the body are pale olive brown, with metallic reflections of purple and blue; the sides of the head, the base of the tail, and whole under parts are pure white, except the under tail-coverts, which as well as the upper are chestnut; the tail is black. It is about as large as a pigeon.

The Lapwing is spread over the northern half of the Eastern Hemisphere, from Ireland to Japan, and from Iceland to Calcutta. In this country it is partially migratory; for though many reside with us all the year, yet "numbers leave these

islands, and others annually perform a periodical migration to the breeding-grounds, arriving there with as much regularity as our summer visitors from a distance."* Large downs, the sheep-walks of an open unenclosed country, wild heaths, and commons, boggy pastures, wet meadow-lands, and marshes near lakes and rivers, are the favourite resorts of these beautiful birds. In such situations immense numbers congregate at the breeding-season, separating into pairs to assume the parental joys and cares. "When incubation has fairly commenced," observes Sir William Jardine, "the common or moor often appears alive with their active motions; no stranger or intruder can enter upon their haunts without an examination, and both, or one of the pair, hover and fly around, tumbling and darting at him, and all along uttering their vehement cry of *Peeswit*. When incubation is completed, the young and old assemble together, and frequent the pastures and fallows; some particular fields being often chosen by them in preference to others, probably on account of the abundance of food; and here they will assemble daily for some time, feeding chiefly in twilight or clear nights, and resting during the day.

The clouds of birds that rise about sunset, to seek their feeding-grounds, performing many beautiful evolutions ere they go off, is incredible, except to one who has witnessed it. In Holland, where this bird is extremely abundant, and where the view on all sides is bounded equally by a low horizon, thousands may be seen on all sides at once, gleaming in the setting sun, or appearing

* Jardine.

like a dense black moving mass between its light and the spectator." *

The eggs of this bird are nearly two inches long, of an olive hue, spotted all over with blotches of brown. Four are laid, in some slight depression of the ground, on which a few blades of dried grass form the only nest. These eggs are well known as an esteemed luxury for the table, and may be seen in the shops of the London poulterers in great numbers in the months of April and May. The flat and low counties around the metropolis afford the chief supply to this market; and the trade of collecting them affords employment to many individuals during the season. "Great expertness in the discovery of the nests is shewn by those accustomed to it, who generally judge of their situation by the conduct of the female birds, which invariably, upon being disturbed, run from the eggs, and then fly near to the ground for a short distance, without uttering any alarm-cry. The males, on the contrary, are very clamorous, and fly round the intruder, endeavouring, by various instinctive arts to divert his attention. So expert have some men become, that they will not only walk straight towards a nest, which may be at a considerable distance, but tell the probable number of eggs it may contain, previous to inspection; generally judging of the situation and number of eggs by the conduct of the female bird. In some counties, however, all the most likely ground is carefully searched for eggs once every day, by women and children, without any reference to the actions of the birds."† Dogs are also trained to search for the eggs.

* Nat. Lib. Ornithology, iii. 282. † Yarrell's Brit. Birds, ii. 482.

The food of the Lapwing consists largely of earth-worms, to which are added slugs, insects and their larvæ, and small *crustacea*. It is not unfrequently kept in gardens, where it soon becomes an interesting pet, and by its destruction of vermin proves useful. Its mode of obtaining earthworms is thus described by Dr. Latham: "I have seen this bird approach a worm-cast, turn it aside, and after walking two or three times about it, by way of giving motion to the ground, the worm come out, and the watchful bird, seizing hold of it, draw it forth."

Family II. Ardeadæ.

(*Herons.*)

Mr. Swainson considers that the Herons shew the strongest affinity to the Ostriches, but we confess that to us they appear to present more points of dissimilarity than resemblance. They are decidedly carnivorous in their appetite, feeding on fishes, aquatic reptiles, small mammalia, mollusca, worms, and insects. The Cranes, however, are more terrestrial than the others, and join with an animal diet, grains, seeds, and herbage. The legs and feet in these birds are long and slender, as is also the neck, which is very flexible: the beak is long, straight, sharp-pointed, firm in texture, and very powerful; in some genera it is of great thickness and strength. The Spoon-bills, however, shew an exception to the sharpness of this organ; and the Curlews to its straightness. The wings are, in general, well developed, and some of the genera are birds of soaring and power-

ful flight. The hind toe is always present, but its position and development vary in different genera.

The typical Herons have the above characters in greatest perfection: they are the most beautiful of all the Waders, not so much from the colours of their plumage, which however are chaste and agreeable, as from their taper and graceful forms, the curves of their slender necks, and the elegant hanging crests, and long decomposed plumes that adorn various parts of their bodies. Their plumage is copious, but somewhat lax, particularly on the neck. They build in society, but live solitary. Their common habit is to watch patiently, and without motion, on the margin of the water, or within the shallows; on the appearance of prey, it is transfixed by a sudden stroke of the pointed beak with lightning-like rapidity, and swallowed whole.

The *Ardeadæ* are to be found, in some of their varied forms, in all parts of the globe; the typical genera are numerous in species, and widely distributed. Some of their characters are thus graphically summed up by Willoughby: "These have very long necks; their bills also are long, strong, ending in a sharp point, to strike fish, and fetch them from under stones or brinks; long legs, to wade in rivers, and pools of water; very long toes, especially the hind toe, to stand more firmly in rivers; large crooked talons, and the middle serrate on the inside, to hold eels and other slippery fishes the faster,* or because they sit on trees; lean and carrion bodies, because of their great fear and watchfulness."

* We believe the Herons never take or hold their prey with the foot.

Genus *Botaurus*. (Briss.)

The Bitterns are distinguished by having the beak as long as, or rather longer than, the head, strong, higher than broad, the mandibles of equal length, the upper mandible slightly curved downwards. The nostrils are basal, linear, longitudinal, lodged in a furrow, and partly covered by a naked membrane. The legs are comparatively short and strong, the toes long and slender, all unequal, the middle toe as long as the tarsus; the hind toe on the level of the others; the claw of the middle toe serrated on its inner edge. The wings are long, rather rounded, the first three quills longest, and nearly equal. The back of the neck is bare of feathers, but the plumage of the sides, which is particularly long and lax, ordinarily meets across the back.

The Bitterns are spread over both hemispheres, but are not found in Australia; they are nocturnal birds, which love to skulk in the cover of reeds, and other aquatic herbage, through which their remarkably thin, compressed bodies enable them to run with great ease and celerity. Their voices are loud and hollow, sometimes harsh and piercing. The general colours of the plumage are yellow, merging into rufous, and black; the latter frequently taking the form of numerous spots or freckles; at other times the hues are disposed in broad masses, and the black is replaced by a deep sea-green, with metallic reflections.

The name of the Common Bittern (*Botaurus stellaris*, Linn.), or, as it was formerly spelled,

Bittour, was probably derived from its voice, which, uttered as the bird rises spirally to a vast height in the dusk of evening, is thought to resemble the deep-toned bellowing of a bull. The names which are given to the species, in some of the rural districts of England, such as *Bull of the bog*, *Mire-drum*, &c., refer to this booming sound.

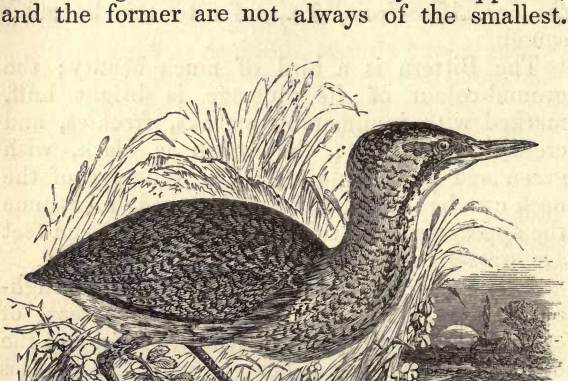
The Bittern is a bird of much beauty; the ground-colour of its plumage is bright buff, marked with innumerable streaks, freckles, and crescents of black; the crown is black, with green and purple glosses. The plumage of the neck can be thrown forward, and made to assume the appearance of a thick ruff. The legs and feet are grass-green.

In former years the Bittern was common throughout Great Britain, but owing to the increase of cultivation, the reclaiming of waste-lands, and the drainage of marshes, it has gradually become less frequently met with, and may now be classed among the rare British birds. Yet, from circumstances unexplained, it is even now, in some years, comparatively numerous in favourable localities, where, perhaps, for several seasons before and after, not a specimen is to be seen. Its occurrence is therefore considered as an event of sufficient interest to be recorded. The winters of 1830-31, 1831-32, and 1837-38, were remarkable for the number of specimens that were procured. Instances of the breeding of this species are rare in England.

On the continent of Europe, however, the Bittern appears much more common; nor is it confined to this quarter of the world; for specimens,

procured in Sweden, Barbary, South Africa, Siberia, Bengal, and Japan, do not appreciably differ from each other.

The Bittern is a voracious feeder: small mammalia, birds, and fishes, alternate with frogs, newts, slugs, and insects, to satisfy his appetite; and the former are not always of the smallest.



COMMON BITTERN.

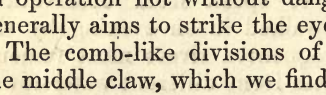
Sir William Jardine has found a Water Rail whole in the stomach of one; and from that of another, Mr. Yarrell has taken the bones of a pike of considerable size; and in a third instance a Water Rail whole, and six small fishes. In Graves's "British Birds," it is stated that in one dissected in 1811, the intestines were distended with the remains of four eels, several newts, a short-tailed field-mouse, three frogs, two buds of the water-lily,

and some other vegetable substances. It is chiefly during the night that the Bittern feeds; by day he remains skulking among the reeds or coarse weeds of the marsh, or river-margin, and is not easily flushed. On the approach of night he emerges from his retreat, and rising on the wing soars in spiral circles to a great height, uttering, as he goes, his hollow boom. Goldsmith's description of this sound, to which superstition was wont to attach somewhat of an unearthly character, is poetical and interesting, the rather because he seems to speak from observation. "Those who have walked in an evening by the sedgy sides of unfrequented rivers must remember a variety of notes from different water-fowl; the loud scream of the wild-goose, the croaking of the mallard, the whining of the lapwing, and the tremulous neighing of the jack-snipe. But of all those sounds there is none so dismally hollow as the booming of the Bittern. It is impossible for words to give those, who have not heard this evening call, an adequate idea of its solemnity. It is like the interrupted bellowing of a bull, but hollower and louder, and is heard at a mile's distance, as if issuing from some formidable being that resided at the bottom of the waters." And he adds, "I remember in the place where I was a boy, with what terror this bird's note affected the whole village; they considered it as the presage of some sad event, and generally found or made one to succeed it. I do not speak ludicrously; but if any person in the neighbourhood died, they supposed it could not be otherwise, for the *night-raven* had foretold it; but if nobody happened to die, the

death of a cow or a sheep gave completion to the prophecy." *

A wounded Bittern fights with desperation, lying on its back and endeavouring to clutch its adversary with its claws, as well as striking vigorously with its sharp, formidable beak. Hence, in the days of falconry, when this bird, which was favourite game, was brought down, it was the duty of the falconer to run in quickly, and seizing the beak of the Bittern, to plunge it into the firm ground, to prevent injury to the Falcon; an operation not without danger, as the Bittern generally aims to strike the eyes.

The comb-like divisions of the inner edge of the middle claw, which we find in all the Herons, have given rise to no little difference of opinion on the subject of their intended purpose.



CLAW OF HERON.

The structure is found in widely different birds, such as the Nightjar among the Fissirostral *Passeres*, and the Frigate-bird among the *Pelecanidæ*. From our own observation, we have no doubt of its object being the freeing of the plumage from insect-parasites. A glance at its structure will shew that no greater power of grasping or of holding a branch is, or can be possessed by a claw having these narrow parallel slits in its edge (for they are not *serratures*) than by one of the ordinary structure.

* Anim. Nature, iii. 263, 264.

Family III. Scolopacidæ.

(*Snipes.*)

The most remarkable characteristic of this Family is the extreme length and slenderness of the beak, which, far from possessing the strength and firmness of the Herons, is extremely weak and flexible. Of course this structure is more conspicuous in what are known as the typical genera, than in those which lead off from them into connexion with neighbouring Families. In the former the tip of this long beak is covered with a soft skin, extremely sensitive; and the organ is employed as a probe to feel the soft mud or earth, into which it is thrust, and to capture there minute insects and animalcules, which could not be discovered by any other sense. They have the hind toe jointed on the tarsus above the level of the fore toes, and so short as to be unable to touch the ground. In some it is absent.

The feet and necks of these birds are, generally, of moderate length; the wings long and pointed; and hence the flight is swift and sustained: the tail is short and even; the front toes frequently united by a membrane more or less considerable. Their plumage is of chaste and subdued tints, frequently presenting a mottled assemblage of black, white, and rufous hues, often disposed in elegant contrast; at other times a nearly uniform greyish olive is the prevalent hue. Their flesh is held in high esteem.

The Snipes are widely distributed; a considerable number of the species are found in Britain,

where, however, they are all more or less migratory in their habits. The majority of them frequent marshes, the banks of lakes and rivers, or the sea-coast, on which they run with great swiftness. A few species affect the shade of woods and coppices, but even these select, as favourite resorts, the most humid spots they can find. They lay four eggs, of a somewhat conical form, with but little nest; and the business of incubation is performed on the ground of inland moors and fens. The young are able to run about as soon as they escape from the shell; when they are clothed with down. With the exception of a very few polygamous species, the females are larger than the males. Many of them feed, and perform their migrations during the night, and these have the eye very large in proportion to the head.

Genus *Scolopax*. (Linn.)

The following are the generic characters of the restricted Snipes, inclusive of the Woodcocks. The beak is lengthened, straight, flattened at the base, slightly curved at the tip, where it is dilated; the tip of the lower mandible fitting into the upper; the legs and feet are slender, moderately long; the wings moderate, the first or second quills the longest.

Of the five species of this genus which are met with in England, either permanently or occasionally, we select the Common Snipe (*Scolopax gallinago*, Linn.) to illustrate the Family. Its ground colour is a rich dark brown, so deep in some parts as to be almost black, variously spotted, striped and banded with white, which, on the

back, is suffused with rufous; the under parts are white, beautifully and regularly banded on the sides with black. The end of the beak, as Mr. Yarrell has observed, "when the bird is alive, or recently killed, is smooth, soft, and pulpy, indicating great sensibility; but some time afterwards

COMMON SNIPE.

it becomes dimpled like the end of a thimble. If the upper mandible be macerated in water for a few days, the skin or cuticle may be readily peeled off; and the bones thus laid bare, present a similar appearance. The external surface pre-

sents numerous elongated, hexagonal cells, which afford at the same time protection, and space for the expansion of minute portions of nerves supplied to them by two branches of the fifth pair; and the end of the bill becomes, in consequence of this provision, a delicate organ of touch, to assist these birds when boring for their food in soft ground; this enlarged extremity of the beak possessing such a degree of sensibility as to enable these birds to detect their prey the instant it comes in contact with it, although placed beyond the reach of sight." *

The mode of feeding, in which this well-endowed organ comes into requisition, is not a little singular. A writer in the "Magazine of Natural History" thus describes it, as observed by himself with a powerful telescope: "I distinctly saw them pushing their bills into the thin mud, by repeated thrusts, quite up to the base, drawing them back with great quickness, and every now and then shifting their ground a little." And we have ourselves seen a closely-allied species feeding at less than half a stone's cast distance, wading in water that reached just above the tarsal joint. At this depth the beak could just touch the bottom, and thus it walked deliberately about, momentarily feeling the mud with its sensitive beak-tip, striking with short perpendicular strokes, without withdrawing the beak from the water. The action of swallowing, now and then, was distinctly perceived. We observed that when thus occupied, the faculties were so absorbed that the bird appeared unconscious of danger, nor could it be roused, though so near, without repeated shouts.

* Brit. Birds, iii. 29.

The Snipe breeds with us, selecting the edges or drier spots of the wet moors and fens, or the barren heaths of the northern districts. About the beginning of April, the male Snipe begins to utter his calls of invitation to his mate. "At this season," say Sir W. Jardine, "or when the pairing has commenced, the birds may be heard piping among the herbage, or may be both seen and heard in the air, performing their evolutions, and uttering the loud drumming sound, which at one time gave rise to so much discussion in regard to the manner in which it was performed. The sound is never heard, except in the downward flight, and when the wings are in rapid and quivering motion; their resistance to the air, without doubt, causes the noise, which forms one of those agreeable variations in a country walk, so earnestly watched for by the practical ornithologist." * Mr. Selby compares the sound to the bleating of a goat (a resemblance which has been often noticed), and observes that at this season the bird soars to an immense height, remaining long upon the wing; and that its notes may frequently be heard when the bird itself is far beyond the reach of sight. These flights are performed principally towards the close of day, and are continued during the whole season of breeding. The nest is very slight, consisting of nothing more than a few dry blades of grass or decaying herbage, collected beside a tuft of grass, or merely a scraped hollow. Four eggs are deposited, about an inch and a half in length, of a yellowish or a greenish hue, marked with spots of pale and dark brown, running somewhat obliquely.

* Nat. Lib. ORNITHOLOGY, iii. 180.

The young, when hatched, grow very fast, and soon become very large, being often, before they are able to fly, larger than the parents.

Sir Humphrey Davy, who observed many nests of these birds in the month of August, in the Orkneys, remarked that the old birds were much attached to their offspring; and if any one approached they would make a loud and drumming noise above his head, as if to divert his attention from their nest.

Though the Snipe, as we have thus seen, is to a certain extent, a permanent resident in these islands, it is partially migratory also. The numbers of those bred here, are not sufficient to account for the flocks that sometimes appear in August, in which month as many Snipes may often be killed as at any time in the year. Mr. Selby states that great flights come every season from Norway and other northern parts of Europe; arriving in Northumberland in the greatest numbers early in November. They seldom remain long in one situation, moving from place to place, under the influence of various causes, so that the sportsman who has enjoyed excellent Snipe-shooting one day, may find the same spots entirely deserted on the following.

The food of the Snipe consists of worms, the larvæ of insects, small *mollusca* and *crustacea*, with which are often taken into the stomach minute seeds, perhaps adhering to their animal food. One kept by Mr. Blyth in confinement would eat only earth-worms.*

* Yarrell's Brit. Birds, iii. 30.

Family IV. Palamedeadæ.

(*Screamers.*)

Of this very limited, but widely distributed Family, very little is known. Hence their true affinities and their position in the natural system is still matter of some uncertainty. We follow Mr. G. R. Gray, who, in his "Genera of Birds," elevates them, few as they are in number, to the rank of a Family. Some of them seem modified on the type of the Plovers, and manifest in their anatomy and other points an approach to certain Lapwings; others, again, bear a resemblance to the *Gallinacea*, with which they have been supposed to connect themselves through the great-footed *Megapodidæ*. But their strongest affinities are, we think, with the *Rallidæ*, especially with the genus *Porphyrio*, which they resemble in their greatly developed toes, their spurred wings, and their habits of walking upon aquatic plants.

The beak is usually slender, rather short, more or less compressed at the sides, and curved downwards at the point. The wing is armed at the shoulder with one or more spurs, of a horny texture, and sharp pointed, which, where most developed, seem to be used as weapons of offence. The feet are long, as are also the legs (*tibiæ*), the lower portion of which is bare of feathers, and scaled; the toes are four, three before and one behind, the latter resting on the ground; the whole are greatly lengthened, and furnished with exceedingly long, straight, and pointed claws, by the expansion of which the birds are enabled to

walk with ease and celerity on the leaves of aquatic plants that float on the surface of rivers and lakes in tropical countries. Their food is believed to consist principally of the seeds and leaves of such plants as grow in the waters.

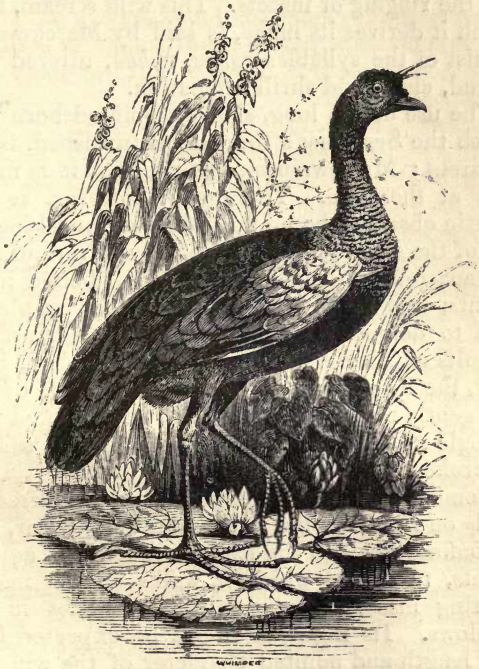
The tropical regions of South America, Africa, and Asia, are the native countries of these birds, which are found only in the vicinity of large expanses of water.

Genus *Palamedea*.

The Screamers are large birds which are confined to the hot and teeming forests of South America. They have the beak shorter than the head, covered at the base with small feathers slightly arched, rather high at the base, tapering to the point, where it descends somewhat abruptly. The forehead is armed with a long, slender pointed horn. The nostrils are oval and open. The wings are armed with two spurs, the one large and lancet-shaped, situated on the shoulder, the other a little nearer to the tip; these are firmly fixed on a bony core: the third and fourth quills are the longest. The front toes are united at the base by a small membrane; the hind claw is very long, straight, and sharp: the tarsi are clothed with regular many-sided scales instead of transverse plates.

There is only one ascertained species, the Horned Screamer (*Palamedea cornuta*, Linn.), called in Brazil the Anhima, and in Guiana the Camichi or Camouche. It is larger than a goose, of a greenish-black hue, variegated on the long neck with white, and marked with a large cinnamon-coloured spot on the shoulder.

This singular bird is an inhabitant of the inundated grounds of South America, where the immense rivers overflowing their banks, cover large



HORNED SCREAMER.

tracts of flat country with sluggish water, which soon becomes choked up with multitudinous forms of rank aquatic vegetation. In the vast swamps and morasses thus formed, which teem with the

most singular forms of animal and vegetable life, the Horned Screamer raises its extraordinary and startling voice at intervals above the incessant din of mingled cries, the croaking of myriads of frogs, and the ringing of insects. This wild scream, from which it derives its name, is said by Marcgrave to consist of the syllables *vyhou, vyhou,* uttered with a loud, clear, and shrill intonation.

The use of the long, slender, pointed horn with which the Screamer's forehead is furnished, is not apparent: Mr. Swainson believes that it is moveable at the base. There can, however, as Mr. Martin observes, be no possibility of mistaking the use of the shoulder-spurs. Snakes of various size, all rapacious, and all to be dreaded, abound in its haunts, and these formidable weapons enable the bird to defend itself and its young against the assaults of such enemies. If not attacked, however, the Screamer is an inoffensive bird, of shy but gentle manners. The male is contented with a single mate, and their conjugal union is said to be broken only by death.

Some writers have asserted that the Screamer feeds on reptiles; but it would rather appear, that it confines itself to the leaves and seeds of aquatic plants, to obtain which it walks on the matted floating masses of vegetation, or wades in the shallows. Its flight, as might be expected from the length and pointed character of the wings, is sweeping and powerful; on the ground its gait is stately, its head proudly erected, whence, probably, it was regarded by the older travellers, as allied to the Eagle.

The nest of this singular bird is made on the ground at the root of a tree, in which it lays two

eggs, resembling those of a goose. The stomach, notwithstanding its vegetable food, is but slightly muscular: the windpipe (*trachea*) has an abrupt bony box or enlargement about the middle, somewhat like that of the male Velvet Pochard (*Oidemia fusca*). The loud and piercing character of its voice is doubtless connected with this remarkable structure.

Family V. Rallidæ.

(*Rails.*)

In the very valuable and elaborate observations of the late Mr. Vigors on the affinities of animals, he remarks that the *Rallidæ* are separated from the other Families of their Order, and united among themselves, by the shape of their body, which is compressed and flattened on the sides, in consequence of the narrowness of their sternum. "If we were allowed," continues this acute naturalist, "to draw an inference from the analogical construction of other bodies, which move with the greater facility through the water in proportion as they assume this compressed and keel-like form, we might almost conclude that this structure, peculiar to the birds of the present Family, facilitates their progress through that element, and is intended to counterbalance the deficiency in the formation of the foot, which separates them from the truer and more perfectly formed water-birds. . . . . It is certain that the greater portion of these birds are excellent swimmers; and in such habits, as well as in the shortness of their *tarsi*, which is equally conducive to

their powers in swimming, they are found to deviate from all the remaining groups of the Order. They thus become an aberrant Family, and lead directly to the succeeding Order of *Natatores* [the *Anseres* of LINN]." *

Not less interesting are the remarks of Mr. Swainson on the same subject, especially as they tend to shew a point of affinity, lying in another direction. After observing that the Rails and Water-hens, constituting a very natural Family of Waders, have been designated by these familiar names, from their peculiarly harsh notes, and from assuming much of the appearance of the Gallinaceous birds, another proof that the true analogies of nature are often perceived by the vulgar, though passed over by the scientific,—he thus proceeds:—"The most permanent differences in their structure, when compared with the foregoing Families (those of the Sandpipers and the Plovers), are, the great size of the leg, and the length of the toes, particularly the hinder one; the body is very thin and unusually flattened [vertically]; a structure particularly adapted to the habits of Rails, since they live for the most part in the tangled recesses of those reeds and aquatic vegetables which clothe the sides of rivers and morasses. They are for the most part solitary and timid birds, hiding themselves at the least approach of danger, but quitting their semi-aquatic retreats in the morning and evening, to feed in more open spots: their flight, from the shortness of their wings, is very feeble, but they run with swiftness; and by the peculiarly compressed form of their body, are able to make their

* Linn. Trans. vol. xv.

way through dense masses of reeds and high grass with so much facility as to escape even after being desperately wounded. The flesh of all these birds is delicate; and from living chiefly upon aquatic seeds and vegetable aliment, they may be considered as aquatic *Gallinacea*." * To these points of resemblance may be added, that many of the species of this Family construct nests of accumulated materials, and lay a great number of eggs.

As in the Family just dismissed, the great length of the toes enables these birds to walk on aquatic herbage without sinking, or on the soft mud and ooze of lakes and morasses. Many swim and dive with a facility not surpassed by that of any of the Ducks, though the feet are not webbed. Some of the most aquatic, however, have a narrow margin of membrane running down each side of the toes, and in one genus this is dilated at intervals, so as to constitute each toe a broad scolloped oar. Flight is rarely resorted to by them as a means of progression or of escaping danger; the posterior limbs are the principal depositories of muscular energy; the *sternum* is remarkably narrow, the wings short, concave, and moved by feeble muscles; hence the flight, which can be sustained only for a short distance, is slow, heavy, and fluttering; and, during the unwonted exertion, the long legs and feet hang helplessly and awkwardly downward. But on the ground, the close array of tall reeds, or the high grass of the meadow, presents no obstacle to their speed, these they thread with surprising ease; and the bird, which the observer has just seen

* Classification of Birds.

enter the grassy cover at his feet, he hears almost the next moment at the farthest end of the field, with no indication of its transit, except such as was revealed by a narrow line of motion which shot along the waving surface.

With respect to the other distinctive characters of the Family, we may mention that the beak is in general short, and greatly compressed, frequently running up in a sort of shield upon the forehead; the tail is excessively short, and nearly hidden by the coverts; it is usually carried erect. The toes are all on the same level.

Genus *Gallinula*. (Briss.)

In this genus the beak is short, compressed, pointed, high at the base, where it ascends on the forehead in a broad shield; the nostrils pervious, and pierced in a wide furrow, in the middle of the beak. Wings short, concave, the second or third quill longest; the shoulder armed with a small spine, not projecting. Legs rather short, strong, naked a little above the heel; feet large; toes long, and rather slender, divided to the base, bordered with a narrow membrane; hind toe comparatively short; claws compressed, very acute. Plumage soft and thick, but loose in texture.

In all our lakes, large ponds, and still rivers, particularly such as are fringed with thick brushwood, or coarse weeds and rushes, the Common Gallinule or Moor-hen (*Gallinula chloropus*, Linn.) is a well-known bird. It is of a dark olive-brown hue on the upper parts, the head, neck, breast, and sides, dark lead-grey, becoming almost white on the belly: the beak and the feet are yellowish-

green, but the base of the former as well as the forehead-shield, and that part of the leg just above the heel, are bright scarlet.

MOOR-HEN.

The Moor-hen may often be seen swimming in the open water of rivers and ponds; which it does with much grace and swiftness, with a nodding motion of the head; it frequently picks floating seeds, shells, or insects, from the surface. It is very wary, and on the approach of an intruder it either dives, or rising just high enough to flap its wings, flutters along the surface with much plashing, to gain the nearest cover. In the former case, it swims a long way beneath the surface before it rises again, aiding its progress by striking vigorously not only with the feet, but also with the short and hollow wings, which are expanded.

The whole plumage, when immerged, is coated with a thin pellicle of air, which has a singular and beautiful effect. In a small cover, if it suspect the continuance of danger, it will remain beneath the water for an incredible space of time, probably holding fast by the stalks or roots of the sedges.

With all its native shyness and susceptibility of alarm, the Moor-hen soon learns to disregard intrusion, when it finds that no danger accrues, and becomes tame and confiding. Pennant speaks of a pair in his grounds, which never failed to appear when he called his ducks to be fed, and partook of their corn in his presence. Mr. Yarrell observes that among the many aquatic birds with which the Ornithological Society have stocked the canal and the islands in St. James's Park, are several Moor-hens; in the course of the summer of 1841, two broods were produced, the young of which were so tame that they would leave the water and come up on the path, close to the feet of visitors, to receive crumbs of bread.

The fry of fishes, water-insects and their larvæ, especially the grubs of the larger Dragon-flies, water-snails, and crustacea, as well as the seeds of aquatic plants, afford food to the Moor-hen in its more proper element; but it seeks analogous substances on the land also, walking on the grassy borders of lakes, or through the low-lying meadows, at morning and evening dusk, particularly after warm rains. In winter they perhaps find other resources, as suggested in the following interesting note by Mr. Jesse. "The disappearance of Water-hens from ponds during a hard frost has often surprised me, as I could not make out

where they were likely to go for food and shelter when their natural haunts were frozen over. When the ice has disappeared, the birds have returned. I have lately discovered, however, that they harbour in thick hedges and bushes, from which they are not easily driven; aware, probably, that they have no other shelter. They also get into thorn-trees, especially those covered with ivy, and probably feed on the berries, although their feet seem but ill-adapted for perching. During a very severe frost, a pair of Water-hens kept almost entirely in a large arbutus-tree on a lawn, which was inclosed by a high paling, and had no pond near it. Here they probably fed on the berries of the tree, and the other produce of the garden." *

The nest of this bird is composed of dry rushes, grass, or other coarse materials accumulated in considerable quantity among reeds or herbage, near the water's-edge; sometimes on the low branch of a tree which droops into the stream. In the "Naturalist," a case is recorded in which the nest floated on the water without any attachment whatever to the island which it adjoined, but was inclosed on all sides by sticks, &c. Thus situated, the careful parents hatched their eggs in perfect safety; though, had the water risen to an unusual height, the case might have been otherwise.

Curious instances of sagacity, or what one would call presence of mind, in this bird's behaviour when danger threatens her eggs or infant-brood, are on record, from which we select the following. The charming writer already quoted, Mr.

* Gleanings, p. 303.

Jesse, observes,—"The Moor-hen displays sometimes a singular degree of foresight in her care for her young. It is well known that she builds her nest amongst sedges and bulrushes, and generally pretty close to the water, as it is there less likely to be observed. In places, however, where anything like a flood is likely to take place, a second nest, more out of the reach of the water, is constructed, which is intended to be in readiness in case a removal of the eggs or young ones should be found necessary. This observation was made by a family residing at an old priory in Surrey, where Moor-hens abound, and where the fact was too often witnessed by themselves and others, to leave any doubt upon their minds."*

"During the early part of the summer of 1835," observes Mr. Selby, "a pair of Water-hens built their nest by the margin of the ornamental pond at Bell's Hill, a piece of water of considerable extent, and ordinarily fed by a spring from the height above, but into which the contents of another large pond can occasionally be admitted. This was done while the female was sitting; and as the nest had been built when the water-level stood low, the sudden influx of this large body of water from the second pond caused a rise of several inches, so as to threaten the speedy immersion and consequent destruction of the eggs. This the birds seem to have been aware of, and immediately took precautions against so imminent a danger; for when the gardener, upon whose veracity I can safely rely, seeing the sudden rise of the water, went to look after the

* Gleanings, p. 215.

nest, expecting to find it covered, and the eggs destroyed, or at least forsaken by the hen, he observed, while at a distance, both birds busily engaged about the brink where the nest was placed; and when near enough, he clearly perceived that they were adding, with all possible despatch, fresh materials to raise the fabric beyond the level of the increased contents of the pond, and that the eggs had, by some means, been removed from the nest by the birds, and were then deposited upon the grass, about a foot or more from the margin of the water. He watched them for some time, and saw the nest rapidly increase in height; but I regret to add, that he did not remain long enough, fearing he might create alarm, to witness the interesting act of the replacing of the eggs, which must have been effected shortly afterwards; for upon his return, in less than an hour, he found the hen quietly sitting upon them in the newly-raised nest. In a few days afterwards, the young were hatched, and, as usual, soon quitted the nest, and took to the water with their parents. The nest was shewn to me *in situ* very soon afterwards, and I could then plainly discern the formation of the new with the older part of the fabric." *

The young soon display a good deal of sagacity in avoiding danger, and in obeying the monitory signals of their watchful parents. Mr. Rennie says that he has seen a young brood, evidently not above two days old, dive instantaneously, even before the watchful mother seemed to have time to warn them of his approach, and certainly before

* Proceedings of Berwicksh. Naturalists' Club.

she followed them under water.* And Mr. Jesse, having disturbed a Moor-hen that had just hatched, tells us that "her anxiety and manœuvres to draw away her young were singularly interesting. She would go a short distance, utter a cry, return, and seemed to point out the way for her brood to follow. Having driven her away," he continues, "that I might have a better opportunity of watching her young ones, she never ceased calling to them, and at length they made towards her, skulking amongst the rushes, till they got to the other side of the pond. They had only just left the shell, and had probably never heard the cry of their mother before."†

The young have the legs and feet of their full size and development, while the feathers of the wings are only beginning to protrude; thus proving how subordinate the organs of flight in this genus are to those of walking and swimming.

Contrary to what is usual among birds, the female Gallinule is more richly adorned than the male; the plumage being of a deeper colour, and the frontal shield being larger, and of a brilliant scarlet, like sealing-wax, while that of the other sex is of a dull brown.

* Habits of Birds, p. 216. † Gleanings, p. 53.

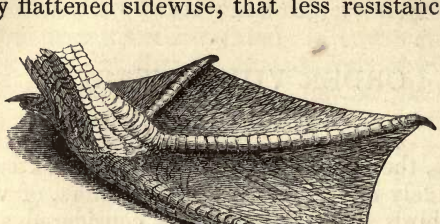
ORDER VIII. ANSERES.

(*Web-footed Birds.*)

This, the last Order of Birds, is very extensive, and widely distributed. As the waters, of which these birds may, generally, be considered as the inhabitants, possess in the different regions of the globe much more in common than the land, we might expect to find their tenants, to a considerable extent, manifesting a similar community. Nor is this expectation found to be groundless, for, not only are the *genera* represented by peculiar species in all countries and upon all coasts, but very many even of the *species* in this Order are found to be truly cosmopolite, many of the Ducks, the Terns, and the Petrels completely circling the globe.

With the trifling exception of the Grebes, which have their feet formed somewhat like that of the Coot, in the last family, the whole Order before us is well marked by having the toes united to each other by a membrane stretched between them, whereby the foot acquires the form of a powerful oar, and of which a familiar example will occur to every reader, in the common Duck or Goose. In addition to this, the feet are placed far back on the body, especially in those species most eminently aquatic, a structure which, while it renders the gait of these birds awkward and shuffling on land, gives to the backward stroke of

the foot in the water an impetus, which is very advantageous in swimming. The tarsus is commonly flattened sidewise, that less resistance may



FOOT OF PELICAN.

be offered to progression in so dense a medium. "In order to make the stroke, the foot is first drawn forwards, when the toes close together and the webs fold, so as to offer to the water the least possible resistance; but when the back stroke is made, the toes spread out, while the action of the limb is at the same time, in most instances, obliquely outwards."

The form of the body is flattened, not however laterally as in the Waders, but horizontally, the better to float on the surface; the breast-bone is very long, affording a bony protection to the greater portion of the intestines. The plumage is remarkably thick and close, particularly on the under parts of the most aquatic kinds; besides which the skin is furnished with a dense coat of soft down. The outer surface of the plumage is in general polished and satiny, having the property (perhaps from being anointed with an oily secretion frequently applied by the beak) of throwing

off water unwetted. The secretion of fat in most of these birds is copious, and it is peculiarly oily in its character. They are the only birds, as Cuvier remarks, in which the neck is longer than the legs, which is sometimes the case to a considerable extent, for the purpose of enabling them to search for food in the depths below, while they swim on the surface. The tail is commonly very short, as are also the wings; hence flight is feebly performed; and in some genera is altogether denied. It must, however, be observed, that in this Order are found the longest wings and the highest powers of flight of the whole class, in the Frigate Pelican; the Petrels and the Terns also are remarkable for their great length of wing: it is remarkable that all these birds, though web-footed, are never seen to swim, though some of them dive or rather plunge with facility.

The flesh of many of the species is extensively used and esteemed as the food of man; that of some, with their eggs, forming a main source of support to many hardy islanders. A few species have been domesticated in our waters and our poultry-yards.

Fens and morasses, broad rivers, and inland lakes, creeks, and estuaries, rocky coves, and muddy bays, precipitous islets and ledgy cliffs, the sinuous coasts of continents and islands, and the broad expanse of the horizon-bound ocean, are the resorts of the web-footed fowl. They are more numerous, particularly the marine kinds, in the colder seas both of the north and south, than in the tropical regions. Our own islands possess a very large number, almost one-third of the species marked as British belonging to this Order.

On this subject, and on the seasonal resorts and habits of these tribes we cannot refrain from presenting to our readers the following charming pictures geographically drawn by Sir William Jardine. After noting the great proportion borne by this Order in the British Fauna, and remarking, that while thousands in summer seek our precipitous coasts and headlands as breeding stations, others, scarcely less numerous, flock in winter to our bays and marine inlets,—he thus proceeds :—

" The contrast of these localities at the different seasons is most striking: rocks standing far in the ocean's void, and precipices of the most dizzy height, to which all approach by land is cut off, possess a dreary solitude for seven or eight months of the year; a few Cormorants seeking repose during the night, or some Gulls claiming a temporary shelter or resting-place from the violence of the storm, are almost the only, and then but occasional, tenants. In the throng of the season of breeding, a very different picture is seen: the whole rocks, and sea, and air, are one scene of animation, and the various groups have returned to take up their old stations, and are now employed in all the accessories of incubation, affording lessons to the ornithological student he will in vain look for elsewhere. The very rocks are lighted up, and would seem to take a brightness from the hurry around, while the cries of the inhabitants, alone discordant, harmonise with the scene.

" During the same season, upon the low sandy or muddy coasts, or extensive meres, where the tide recedes for miles, and the only interruption on the outline is the slight undulation of some mussel-scalps, the dark colour of some bed of

zostera contrasting against the long bright crest of the surf, or in the middle distance some bare posts set up as a land-mark, or the timbers of some ill-fated vessel rising above the quicksand, —there reigns, on the contrary, a solitude of another kind; it is now broken only by the distant roll of the surf, by the shrill pipe of the Ring-dotterel, or the glance of its flight as it rises noiselessly; a solitary Gull or Tern that has lagged from the flock may sail along, uttering, as it were, an unwilling inward sound as it passes the intruder; every thing is calm and still, the sensation increased by the hot glimmer that spreads along the sands; there is no voice, there is no animal life. During winter the scene may at first sight appear nearly similar; the warm and flickering haze is changed for a light that can be seen into; the noise of the surge comes deeper through the clear air of frost, and with it at intervals hoarse sounds and shrill whistles, to which the ear is unaccustomed; acres of dark masses are seen, which may be taken for low rocks or scalps, and the line of the sea in the bays contains something which rises and falls, and seems as if it were about to be cast on shore with every coming swell. To the old sportsman all these signs are familiar, and he knows their meaning; but to one who has for the first time trodden these flat coasts, some distant shot or other alarm first explains every thing. The line of the coast is now one dark moving mass; the air seems alive with water-fowl, and is filled with sounds that rise and fall, and vary as the troops wheel around; and this continues until they have again settled to their rest. As

dusk approaches these sounds are gradually resumed, at first coming from the ground, as warnings that it is time to be alert; as the darkness and stillness of night sets in, one large flock after another hastens to its feeding-ground, and the various calls and the noise of wings is heard with a clearness which is sufficient to enable the sportsman to mark the kinds and trace his prey to their feeding-stations, to make him aware of their approach long before they come within his reach."*

This Order comprises the following six Families,—*Anatidæ*, *Colymbidæ*, *Alcadæ*, *Procellariadæ*, *Laridæ*, and *Pelecanidæ*.

Family I. Anatidæ.

(*Ducks.*)

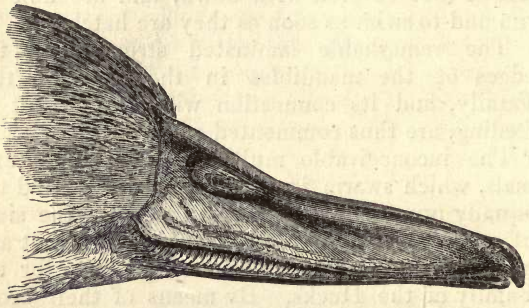
The beak in this great Family is thick, broad, high at the base, covered throughout almost its whole length with a soft skin, the tip alone being horny (the former supposed by some to be analogous to the *cere*, and the small nail-like tip to correspond to what in other birds would be the true horny beak); the edges are cut into a number of thin parallel ridges, or small teeth: the tongue is large and fleshy, with its edges toothed. The wings are in general moderately long. The males have, for the most part, the windpipe enlarged, near the point of its division, into a bony chamber, or capsule, differing in form and size; and some have this tube much prolonged, and bent back in winding folds within the swollen keel of the breast-bone: both of these peculiarities of struc-

* Nat. Lib. Ornithology, iv. 456.

ture have probably a connection with the loudness or intonation of the voice. The gizzard is large and muscular, and especially in those species which are more terrestrial, living largely on grain. They mostly nestle on the ground, but some on trees, and lay numerous spotless eggs; the young are at first covered with down, and are able to run and to swim as soon as they are hatched.

The remarkable laminated structure at the edges of the mandibles in the birds of this Family, and its connection with their habit of feeding, are thus commented on by Mr. Swainson. "The inconceivable multitudes of minute animals, which swarm in the northern seas, and the equally numerous profusion inhabiting the sides of rivers and fresh waters, would be without any effectual check upon their increase, but for the Family of the Ducks. By means of their broad beak, as they feed upon very small and soft substances, they capture, at one effort, considerable numbers. Strength of substance in this member is unnecessary; the beak is therefore comparatively feeble, but great breadth is obviously essential to the nature of their food. As these small insects, also, which constitute the chief food of the *Anatidæ*, live principally beneath the surface of the mud, it is clear that the beak should be so formed as that the bird should have the power of separating its nourishment from that which would be detrimental to the stomach. The use of the laminæ thus becomes apparent; the offensive matter is ejected between their interstices, which, however, are not sufficiently wide to admit the passage of the insect-food at the same time. The mouthful of stuff brought from the bottom is, as

it were, sifted most effectually by this curiously shaped beak; the refuse is expelled, but the food is retained. It is probable, also, that the tongue is materially employed on this process; for unlike that of all [most] other birds, it is remarkably large, thick, and fleshy."*



BEAK OF DUCK.

This Family seems to afford one very obvious link of connexion between the Swimming and the Wading birds, in that division of it known as Geese. They retain some of the manners of the Waders, they walk much more than they swim; their food consists more of grain and insects than of fishes; their legs are long, and they have a considerable space unfeathered above the tarsal joint. This division, including the Swans, also retain a considerable length of neck.

* Journ. Roy. Inst. (August, 1831.)

Genus *Anas*. (Linn.)

Mr. Yarrell gives the following as the characters of the genus *Anas*, in which, however, he includes several species that are separated by other ornithologists. The beak about as long as the head, broad, depressed, the sides parallel, sometimes partially dilated; both mandibles furnished on the inner edges with transverse lamellæ. The nostrils small, oval, lateral, in front of the base of the beak. The legs rather short, placed under the centre of the body; tarsus somewhat rounded; toes three in front, connected by intervening membrane, hind toe free, without any pendent lobe or membrane. The wings rather long, pointed; the tail pointed or wedge-shaped. The sexes differ in plumage.

The true Ducks, as restricted, are found almost everywhere; and specimens of the same species are received from the most distant regions. The Shoveler (*Anas clypeata*, Linn.), for example, is found all over Europe, in the United States, at Smyrna, in North-west India, at Calcutta, and Nepaul; it is common in North Africa, and specimens have been brought from South Africa, and from the islands of Japan. The common Wild Duck again (*Anas boschas*, Linn.), the parent of our domesticated broods, is spread over the whole of the northern hemisphere, in a wild condition.

The plumage of our beautiful Wild Mallard it is scarcely needful to describe; most persons are familiar with his glossy velvet-green head and neck, his collar of white, his breast and back of chestnut, his beauty-spot of shining purple, his

black curling tail, and the delicately pencilled scapular-feathers that fall over his wings. It may not be generally known, however, that in the summer months this distinctive gorgeousness of plumage is laid aside, and the Drake appears for a season in the homely brown livery of his mate.

DUCK.

The tame Duck is almost omnivorous; its indiscriminate appetite, and its voracity equal those of the Hog. In a natural state it is little more particular; fishes, and their young fry, or spawn, tadpoles, slugs, water-insects, larvæ, worms, many plants, seeds, and all sorts of grain, are in turn eagerly devoured by it. Its flesh is in high estimation for the table, and various are the strata-

gems which man puts in requisition to capture by wholesale a bird so greatly prized. The principal of these are the decoys, by which immense multitudes are taken annually in the fenny counties of England. An interesting account of these, accompanied with illustrative engravings, appeared in the "Penny Magazine" for February, 1835. We have not space to describe the details, but some idea may be formed of their effectiveness, as well as of the abundance of this species, from the fact recorded by Pennant, that in one season thirty-one thousand two hundred Ducks were taken in only ten decoys in the neighbourhood of Wainfleet, in Lincolnshire.

The Mallard in a wild state, contrary to the habit of the domestic bird, always pairs: the Duck makes her nest in some dry spot in the marshes, often sheltered by rank herbage, or beneath some low bush; not seldom, however, the nest is built in the branches of a tree, or the head of a pollard, often at a considerable height from the ground; whence the parent is believed to carry down her young ones, one by one, in her beak. The eggs are usually from ten to fourteen in number, of a bluish white hue; when the Duck has occasion to leave them, she covers them carefully with down or other materials.

The Wild Duck is migratory as well as resident with us; those that have bred in this country are reinforced on the approach of winter by immense flocks of this and other species, which wing their way hither from the already frozen lakes and rivers of the more northern latitudes, whither the majority return in spring.

Family II. Colymbidæ.

(*Divers.*)

Much more exclusively aquatic than the Ducks, the Family before us, as their name imports, are remarkable for the readiness and frequency with which they descend beneath the surface of the water, and for the great length of time during which they can remain immersed. They have the beak narrow, straight, and sharp pointed; the head small; the wings short and hollow; the legs, placed very far behind, near the extremity of the body, are flattened sidewise so as to present a thin edge before and behind; the toes armed with broad flat nails. In one genus the toes are united by a membrane, and there is a short tail; in the other two the toes are divided midway to the base, but are margined with broad oval membranes, and there is no vestige of a tail. The latter chiefly affect fresh waters, the former reside upon the ocean.

The backward position of the feet in these birds, while it renders them powerful and fleet swimmers and divers, greatly diminishes their ability for walking. Indeed they scarcely walk at all, for though they can shuffle along awkwardly in an erect position, it is only for a few steps, when they fall down upon their breast, or else remain sitting erect, supported upon their broad feet as a base, the whole tarsus resting on the ground. Their powers of flight are nearly as limited: but under the surface of the water the wings are expanded and used effectually as fins.

The plumage is filamentous or downy, but yet remarkably dense and close lying, and has a silvery or satiny gloss, particularly on the under parts of the body.

The food of the Divers consists, according to their size and the situations they frequent, of fishes with their fry and spawn, crustacea, water-insects, tadpoles, and perhaps vegetable substances occasionally. Their geographical distribution is extensive, though the number of known species is small; the Grebes are widely scattered over the fresh waters of the globe, but the Loons are confined to the temperate and arctic oceans and their coasts.

Genus *Colymbus*. (Linn.)

In the Loons or true Divers, the beak is long, strong, straight, compressed, and pointed; the edges cutting, but not notched: the nostrils, on each side of the base, are perforated, and partly closed by a membrane. The legs are thin, the tarsi compressed, placed far back, and closely attached to the hinder part of the body; the feet large, amply webbed, the outer toe longest: the hind toe jointed upon the tarsus, small; the wings short, the first quill-feather longest; the tail short and rounded.

The habits of these birds are peculiarly marine; they are at home amidst the desolation of the polar seas, on whose wild and frost-bound shores and islands they rear their young, laying their eggs on the bare ground. The general colours of their plumage are black and white, the latter arranged in beautifully regular rows of spots, which are commonly lost in winter.

The largest and finest species is that called the Great Northern Diver, or Loon (*Colymbus glacialis*, LINN.), a frequent visitor to our coasts. It is larger than a Goose, its head and neck are black, glossed with purple or green; the upper parts of the body and wings black, regularly

NORTHERN DIVER.

marked with spots of white set in rows, large and square on the scapulars, elsewhere small and round. Two bands going partly round the neck and the upper breast are white, with each feather marked with black down the shaft: the under parts are pure white.

The Divers live chiefly at sea, except during

the breeding season, and obtain their living by following the shoals of fishes which approach the shallows to spawn, especially the herrings, sprats, &c. These they catch with great ease and certainty by diving, pursuing their prey with swiftness beneath the surface. Dr. Richardson found the Northern Diver more abundant on the interior lakes of Arctic America than in the ocean; he says it destroys vast quantities of fish. "It takes wing with difficulty, flies heavily, though swiftly, and frequently in a circle round those who intrude on its haunts. Its loud and very melancholy cry, like the howling of the wolf, and at times like the distant scream of a man in distress, is said to portend rain. Its flesh is dark, tough, and unpalatable."

The following interesting account of the manners of this species in captivity is given by Mr. Nuttall of Boston. "A young bird of this species which I obtained in the Salt Marsh at Chelsea Beach, and transferred to a fish-pond, made a good deal of plaint, and would sometimes wander out of his more natural element, and hide and bask in the grass. On these occasions he lay very still, until nearly approached, and then slid into the pond, and uttered his usual plaint. When out at a distance he made the same cautious efforts to hide, and would commonly defend himself in great anger, by darting at the intruder, and striking powerfully with his dagger-like bill. This bird, with a pink-coloured iris, like albinos, appeared to suffer from the glare of broad daylight, and was inclined to hide from its effects, but became very active towards the dusk of the evening. The pupil of the eye in this individual,

like that of nocturnal animals, appeared indeed dilatable; and the one in question often put down his head and eyes into the water to observe the situation of his prey. This bird was a most expert and indefatigable diver, and remained down sometimes for several minutes, often swimming under water, and, as it were, flying with the velocity of an arrow in the air. Though at length inclining to become docile, and shewing no alarm when visited, it constantly betrayed its wandering habits, and every night was found to have waddled to some hiding-place, where it seemed to prefer hunger to the loss of liberty, and never could be restrained from exercising its instinct to move onward to some secure or more suitable asylum." *

The eggs are two in number, sometimes three, of a dark olive hue, with a few spots of brown; they are about as large as those of a goose.

Family III. Alcadæ.

(*Auks.*)

The haunts and habits of these singular birds are exclusively maritime; they are oceanic birds formed for diving, living on small fishes obtained in this manner, and on marine crustacea and mollusca. In the Loons we saw the feet removed to the extremity of the body, but these organs were still ample, and were used in the act of diving; in the Auks the tarsi are very short and the feet small; and in progression under water no use whatever is made of the feet, which are

* Quoted in Yarrell's Brit. Birds, iii. 427.

held out behind, like those of the Waders in flight; on the other hand, the short wings are used efficiently in these circumstances, like fins; so that the bird may be said literally to *fly* beneath the surface. "Their movements under water precisely resemble those of the *Dyticidæ* or common Water-beetles; the principal motion being more or less vertical, instead of horizontal as in the Grebes and Loons; they are therefore, together with the distinct group of Penguins, the most characteristic *divers* of the Class."*

The characters of the Family are, that the beak is varying in length, more or less compressed; the upper mandible curving to the tip, which is sometimes hooked: the wings are generally short, and in some little more than rudimentary; the tail short and graduated; the tarsi short and compressed; the toes entirely webbed, the hind toe either wanting or very small.

These birds frequently associate in immense numbers on rocky islets and precipitous cliffs that overhang the sea, on the shelves and narrow ledges of which they lay their eggs, one only deposited by each bird; the female keeping it between her feet for the purpose of incubation, as she sits in an erect position. The procuring of the eggs and young of these and similar birds, forms an important means of subsistence to many families.

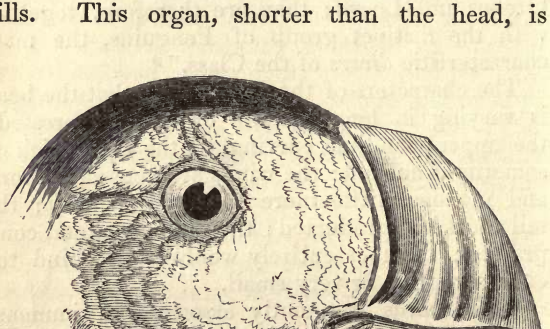
The storm-lashed and iron-bound coasts of Northern Europe and America, and of the extreme southern portion of the latter continent, with the frozen islands of both the Arctic and Antarctic Oceans, are the dreary homes of the

* Mr. Blyth, in Cuvier's Anim. Kingd. Lond. 1840.

birds of this Family; some of which roam hundreds of miles out to sea.

Genus *Fratercula*. (Briss.)

This is a remarkable genus, in which the beak rivals, in its development, the monstrous proportions which are seen in the Toucans and Hornbills. This organ, shorter than the head, is



BEAK OF PUFFIN.

higher than its length, somewhat triangular in outline, very much compressed, with both mandibles arched to the point: the culmen or ridge as high as the top of the head, with a cutting edge, the sides cut into transverse furrows; the corners of the mouth bordered with a dilatable skin; the nostril is a narrow slit placed close to the inner angle of the mandible. The wings are short, narrow, and pointed; the legs, placed far back,

are short; the toes webbed, armed with curved claws, the hind toe wanting.

The Puffins are inhabitants of the northern regions, but are migratory visitors to the more temperate regions, keeping near the shore, concealing themselves by night in the clefts of rocks, or in burrows, which they themselves excavate to the depth of a yard or more. In these burrows the female lays a single egg on the bare ground. Their flight is heavy and rather quick, but only sustained for short distances, commonly just above the surface of the water, which they sometimes strike with their feet to acquire an additional impetus. In the water their speed is great, and they dive with great facility. They principally feed on marine *mollusca* and *crustacea*, to which small fishes are added.

The Common Puffin or Coulterneb (*Fratercula arctica*, Linn.) visits the rocky shores of the British Islands in summer, for the purpose of breeding; remaining from April to August. It is a bird of singularly grotesque appearance: its short thickset form, its erect attitude, and above all, its extraordinary beak, grooved over with furrows, and marked with bright colours, give it a very peculiar aspect. It is not much larger than a pigeon, but of stouter form, and with a greater head: the crown, hind head, whole upper parts, and a collar round the neck are black; the sides of the head and face pale grey, the whole under parts pure white: the central portion of the beak is pale blue, the base with the mouth yellow, the grooves and tip orange; the latter is the hue also of the eyelids, and of the legs and feet.

The shallow surface-earth on the summit of the

coast-cliffs affords an opportunity to the Puffin to excavate its burrow; but not unfrequently it saves itself some labour by taking possession of the burrow of the rabbit; the formidable beak of the

PUFFIN.

bird presenting an unanswerable argument to the discomfited quadruped, when he would presume to dispute the tenancy. Mr. Yarrell enumerates as lodging-stations around this country, the Isle of Man, the coast of Anglesey, the Scilly Islands, where it is more common than in Cornwall; the high cliffs of the Isle of Wight, between the Needle-rocks and Freshwater-gate; the Yorkshire coast; the Fern Islands; Puffin Island in the

Frith of Forth, and others of the numerous Scottish islands.

"Many Puffins," observes Mr. Selby, "resort to the Fern Islands, selecting such as are covered with a stratum of vegetable mould; and here they dig their own burrows, from there not being any rabbits to dispossess upon the particular islets they frequent. They commence this operation about the first week in May, and the hole is generally excavated to the depth of three feet, often in a curving direction, and occasionally with two entrances. When engaged in digging, which is principally performed by the males, they are sometimes so intent upon their work as to admit of being taken by the hand, and the same may also be done during incubation. At this period I have frequently obtained specimens, by thrusting my arm into the burrow, though at the risk of receiving a severe bite from the powerful and sharp-edged bill of the old bird. At the farther end of this hole the single egg is deposited, which in size nearly equals that of a Pullet. Its colour when first laid is white, sometimes spotted with pale ash-colour, but it soon becomes soiled and dirty from its immediate contact with the earth, no materials being collected for a nest at the end of the burrow. The young are hatched after a month's incubation, and are then covered with a long blackish down above, which gradually gives place to the feathered plumage, so that, at the end of a month, or five weeks, they are able to quit the burrow, and follow their parents to the open sea." *

At the lone island of St. Kilda many of these

* Brit. Birds, iii. 470.

birds are said to be taken as they sit on the ledges of the rocks, by means of a noose of horse-hair attached to a slender rod of bamboo-cane. This mode is most successful in wet weather, as the Puffins then sit best upon the rocks, allowing a person to approach within a few yards, and as many as three hundred may be taken in the course of one day by an expert bird-catcher. They are sought principally for their feathers,* which, like those of all these and similar birds, are copious, soft, and downy; and therefore well adapted for beds.

Family IV. Procellariadæ.

(*Petrels.*)

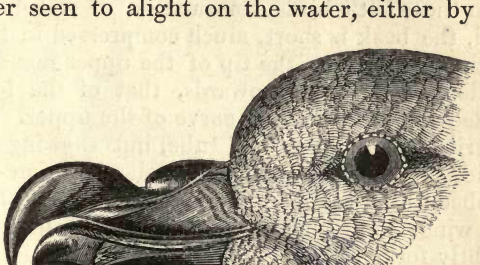
The form of the beak in these birds is very remarkable, as it appears to be constituted of several distinct pieces: the upper mandible has the basal portion separated from the tip by a deep oblique furrow, and carrying on its summit, a tube (or two united into one) which contains the nostrils; the point of this mandible takes the form of a curved and pointed claw or nail; the lower mandible is likewise seamed in a similar manner, and its tip is hooked downwards.

The fore-toes are united by a membrane, the hind-toe is rudimentary, and reduced to a mere claw, which is elevated upon the tarsus. The wings are usually long, and the flight powerful.

The Petrels are eminently oceanic birds, wandering over the boundless seas in all latitudes, rarely approaching the land except in the breeding

* Macgillivray.

season. Some of them appear as if they were almost constantly on the wing, for they follow the course of ships for many days together, and are never seen to alight on the water, either by day



BEAK OF PETREL.

or night. Their food consists of small mollusca and crustacea, and the oily particles which may be found floating on the surface of the sea; some of the species inhabiting high latitudes are the constant attendants on whalers, feasting on the fat of slaughtered whales with extreme voracity. Their flesh becomes, from the nature of their food, saturated, as it were, with oil; and when offended or alarmed many of them eject from their nostrils a quantity of fetid oil, as a defence. Foolish and groundless superstition, in former times, connected these birds with the production of tempests, and many silly names were given them in consequence.

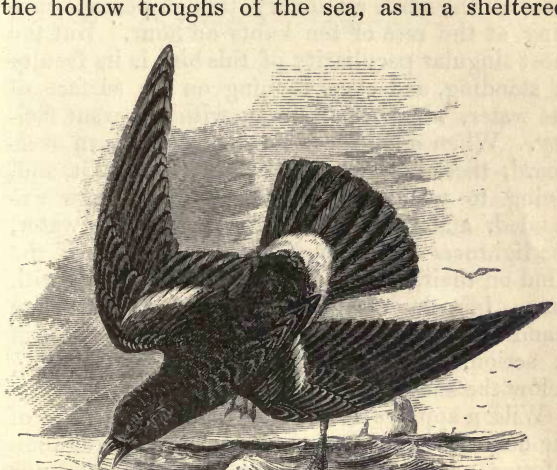
Genus *Thalassidroma*. (Vigors.)

In these little birds, the smallest of web-footed fowl, the beak is short, much compressed in front of the nasal tube; the tip of the upper mandible suddenly curving downwards, that of the lower angled and following the curve of the upper. The nostrils contained in one tube, but shewing two orifices. The tarsi long and slender; fore-toes webbed: hind-toe merely a small, dependent nail; the wings long and pointed; the tail square or slightly forked.

Several species seem to have been formerly confounded under the name of the Stormy Petrel, which are now found to be distinct: we select for illustration that known as Wilson's Petrel (*Thalassidroma Wilsoni*, Bonap.), the most commonly seen in the Atlantic. It is about as large as a Lark; of a sooty black hue, with a broad band of rusty brown across each wing, and one of pure white across the rump; the legs are long, and, with the toes and their membranes, are black, with the centre of the latter pale.

The habits of this species are well described by the admirable ornithologist to whose memory it is dedicated. "In the month of July, on a voyage from New Orleans to New York . . . on entering the Gulf Stream, and passing along the coasts of Florida and the Carolinas, these birds made their appearance in great numbers, and in all weathers, contributing much, by their sprightly evolutions of wing, to enliven the scene, and affording me every day several hours of amusement. It is indeed an interesting sight to observe these little birds in

a gale, coursing over the waves, down the declivities, up the ascents of the foaming surf that threatens to burst over their heads, sweeping along the hollow troughs of the sea, as in a sheltered



WILSON'S PETREL.

valley, and again mounting with the rising billow, and just above its surface, occasionally dropping its feet, which striking the water throws it up again with additional force, sometimes leaping with both legs parallel, on the surface of the roughest waves for several yards at a time. Meanwhile, it continues coursing from side to side of the ship's wake, making excursions far and wide,

to the right and to the left, now a great way a-head, and now shooting astern for several hundred yards, returning again to the ship as if she were all the while stationary, though perhaps running at the rate of ten knots an hour. But the most singular peculiarity of this bird is its faculty of standing, and even running on the surface of the water, which it performs with apparent facility. When any greasy substance is thrown overboard, these birds instantly collect around it, and, facing to windward, with their long wings expanded, and their webbed feet patting the water, the lightness of their bodies, and the action of the wind on their wings, enable them to do this with ease. In calm weather they perform the same manœuvre, by keeping their wings just so much in action, as to prevent their feet from sinking below the surface." *

Wilson appears to have had no knowledge of the domestic economy of this bird, but Audubon informs us that it breeds on some small islands near the southern extremity of Nova Scotia, formed of sand and light earth, scantily covered with grass. Thither the birds resort in great numbers about the beginning of June, and form burrows about two feet deep, in the bottom of which each female lays a single white egg, as large as that of a pigeon, but more oblong. A few pieces of dried grass form the only apology for a nest. The young are able to follow their parents in their seaward flights by the beginning of August.

The present species appears to affect the American more than the European side of the Atlantic

* Wilson's Amer. Ornith. (Edin. 1831), iii. 166.

Ocean, yet several specimens have been obtained in this country.

Family V. Laridæ.

(*Gulls.*)

Through the Skuas, which have somewhat of the form of beak we have last described, the passage from the Petrels to the Gulls is easy and obvious. These are, for the most part, birds of large size, in which the swimming and diving structure recedes, and the most prominent actions are those of flying and walking. "The whole of the Family," observes Mr. Vigors, who includes in it the Petrels, "is distinctly characterized by the strength and expansiveness of their wings, with the aid of which they traverse immeasurable tracts of the ocean in search of their food, and support their flight at considerable distances from land, seldom having recourse to their powers of swimming. We may thus discern the gradual succession by which the characters peculiar to the Order descend from the typical groups that swim and dive well and frequently, but make little use of their wings for flight, to the present groups, which are accustomed to fly much, but seldom employ their powers of swimming, and never dive."* One can scarcely look at a Gull, without being strongly reminded of the Wading-birds, and particularly the Plovers, to which in general form, in attitude, in the long and slender tarsus, with the hind-toe minute and set high up (as in *Vanellus*), in the naked space above the heel, and

* Linn. Trans. vol. xv.

even in the form of the beak, straight, slender, and swelling towards the tip, as well as in their internal anatomy, they shew a manifest approach. The typical Gulls are much more land-birds than any others of their Order: those of the subgenus *Xema* in particular roam much inland, feed on insects and worms, build their nests among herbage in low meadows near the sea, lay eggs of an olive colour marked with large brown spots, and undergo seasonal changes of plumage; all of which might be predicated of the *Charadriadæ*.

The characters of the Family may be thus summed up: the beak is slender, compressed, gradually, not abruptly bent; the nostrils pierced in the middle of the mandible: the wings are very long and pointed; the hind toe elevated, very small, and not united by a membrane. The prevailing colour of the plumage is white, often varied on the upper parts by a pearly grey, or black.

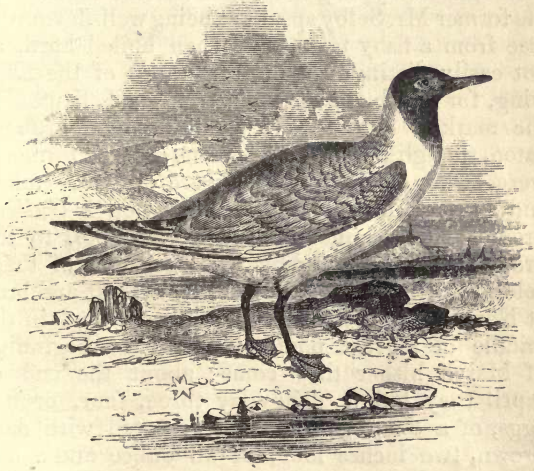
These birds are found in all parts of the world, feeding greedily on all kinds of animal substances; others, as already remarked, seek their food in the interior of the land, which consists of slugs, worms, and the larvæ of insects. Some few are bold and cunning, attacking other marine birds, and forcing them to disgorge the fish they have swallowed, which these then snap up before it reaches the sea.

Genus *Larus*. (Linn.)

In this genus the beak is strong, hard, compressed, cutting, slightly curved towards the point; the lower mandible with a strong angle: the nostrils lateral, near the middle of the beak,

pervious. The wings long, pointed; second quill feather longest, but the first nearly equal. The legs set near the middle of the body, slender, naked at the lower part; the tarsi long, palmated, yet formed for walking: the tail square or slightly forked.

One of our most abundant species is the Black-headed, or Laughing Gull (*Larus ridibundus*, Linn.), the upper parts of whose body are pearl-grey, the lower parts, with the whole neck, pure white; the head, and the tips of the wings black; the beak and feet scarlet.



LAUGHING GULL.

During the summer this Gull frequents marshes and wet meadows, where it produces and brings up its young; in the winter it retires to the sea-

shore. Their periodical migrations from the coast to their breeding localities and back, are so regular that they may be calculated on almost to a day.

The food of this species consists of insects, worms, spawn, fry, and small fishes; it has been seen dashing round some lofty elms catching cockchafers. In spring it follows the plough as regularly as the Rook, and from the great number of worms and grubs which it devours renders no unimportant benefit to the farmer. Nor is this the only way in which these birds are useful; for both their eggs and young are valued for the table. Of the former Mr. Selby speaks as being well-flavoured, free from a fishy taste, and when boiled hard, as not easily distinguishable from those of the Lapwing, for which they are sometimes substituted in the market. He adds, that the young are still eaten, though not in such demand as they formerly were, when great numbers were annually taken and fattened for the table, and when a *Gullery* produced a revenue of from 50*l.* to 80*l.* to the proprietor. Willoughby describes one of these colonies, which in his time annually built and bred at Norbury in Staffordshire, in an island in the middle of a great pool. "About the beginning of March hither they come; about the end of April they build. They lay three, four, or five eggs, of a dirty green colour, spotted with dark brown, two inches long, of an ounce and a half weight; blunter at one end . . . When the young are almost come to their full growth those entrusted by the lord of the soil drive them from off the island through the pool into nets set on the banks to take them. When they have taken them

they feed them with the entrails of beasts, and when they are fat sell them for fourpence or fivepence a-piece. They yearly take about a thousand two hundred young ones, whence may be computed what profit the lord makes of them. About the end of July they all fly away and leave the island."

Another breeding station, which seems to have been occupied by these birds for more than three hundred years, is described in the "Catalogue of Norfolk and Suffolk birds." "Near the centre of the county of Norfolk, at the distance of about twenty-five miles from the sea, is a large piece of water called Scoulton Mere. In the middle of this mere there is a boggy island of seventy acres extent, covered with reeds, and on which there are some birch and willow trees. There is no river communicating between the mere and the sea. This mere has from time immemorial been a favourite breeding spot of the Brown-headed Gull. These birds begin to make their appearance at Scoulton about the middle of February; and by the end of the first week in March the great body of them have always arrived. They spread themselves over the neighbouring country to the distance of several miles in search of food, following the plough like Rooks. If the spring is mild the Gulls begin to lay about the middle of April; but the month of May is the time at which the eggs are found in the greatest abundance. At this season a man and three boys find constant employment in collecting them, and they have sometimes gathered upwards of a thousand in a day. These eggs are sold on the spot at the rate of fourpence a score, and are re-

gularly sent in considerable quantities to the markets at Norwich and Lynn . . . The young birds leave the nest as soon as hatched, and take to the water. When they can fly well, the old ones depart with them, and by the middle of July they all leave Scoulton. We were a little surprised at seeing some of these Gulls alight and sit upon some low bushy willows which grew on the island. No other than the Brown-headed Gull breeds at this mere; a few of them breed also in many of the marshes contiguous to the sea-coast of Norfolk."

Family IV. Pelecanidæ.

(*Pelicans.*)

The most characteristic mark of this the last Family of Birds, is, that the hind-toe, which can be brought partially round to point forward, is united to the others by a connecting membrane, so that the whole four toes are webbed. Notwithstanding this structure, which seems to fit them more completely for an aquatic life, most of these birds do not swim or dive at all, but on the other hand, they perch much on trees. They are all good fliers, and some, from the extreme expanse of their wings, have extraordinary powers of flight. They spend a great deal of time upon the wing, some soaring far out over the ocean, or mounting to a most sublime elevation, others beating over a limited space, till the appearance of a fish beneath them arrests their attention, when they plunge down upon it, and instantly rise again into the air.

With the exception of the Phaetons, which have many of the characters of the *Laridæ*, the members of this Family have more or less naked skin about the face, and on the throat, which latter is dilatable: the tongue is very minute, and the nostrils are mere slits, scarcely or not at all perceptible; in the nestling bird, however, they are open. They all live on fishes, are almost exclusively marine, and nestle and roost either on rocks or on lofty trees: the eggs are encased with a soft, absorbent, chalky substance, laid over the hard shell; the young are at first covered with long and flossy blackish down; they remain long in the nest, and when they leave it, are generally equal, or superior to the adults in weight.

The *Pelecanidæ* are found in the seas and around the coasts of most parts of the globe: but the species are not numerous. The prevailing colours of their plumage are black, often glossed with metallic reflections, and white.

Genus *Phalacracorax*. (Briss.)

The Cormorants, to which genus belong two out of the three species of *Pelecanidæ* that inhabit the British coasts, are distinguished by having the beak long, straight, compressed, the upper mandible terminating in a powerful hook, the base connected with a membrane which extends to the throat, which, as well as the face, is naked. The legs are short, robust, and placed behind the middle of the body: the four toes connected, the hind-toe jointed on the inner side of the tarsus; the outer toe the longest; the claw of the middle toe comb-like on one edge. The wings moder-

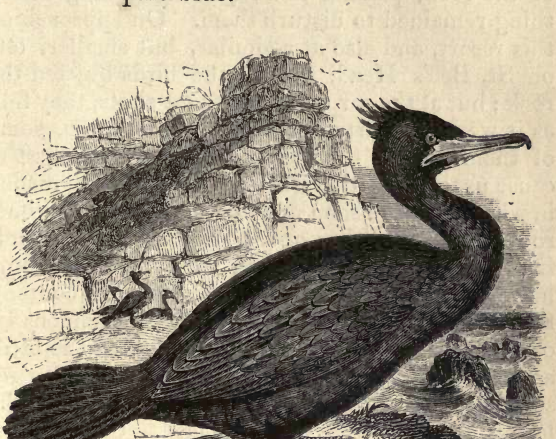
ately long, the third quill the longest; the tail stiff and rigid.

These voracious birds are of dark, but often rich colours, they undergo a seasonal change of plumage, and the young differ from the adults. In winter they perform a partial migration inland to the lakes or rivers; they habitually perch on trees, or sit on the ledges of precipitous sea-ward rocks, on which they make large nests and breed. They are susceptible of domestication, and in some countries still, as in our own formerly, are trained to catch and bring in fish.

The Green Cormorant, or Shag (*Phalacracorax cristatus*, STEPH.), is abundantly distributed around the British coast, and that of the north of Europe: it was also found at the Cape of Good Hope by Dr. A. Smith. The adult male in his winter dress has the whole plumage of a rich, dark, and lustrous green; the upper parts finely bronzed, and each feather margined with a border of fine velvety black; the tail is of a dead black; the base of the beak and small throat-pouch are of a fine yellow hue; the iris of the eye clear green. During the spring a fine tuft or crest of wide and outspread feathers, about an inch and a half high, capable of erection, rises from the crown and hind head, which is lost after the breeding season.

The habits of the Shag are decidedly maritime: it rarely quits the sea to follow the course of a river, nor does it perch on trees, like the other Cormorants. It makes a large nest, composed of sea-weed, in the fissures, and on the ledges of rocks; many associating together; Col. Montagu says he has seen thirty nests close together on a

small rock. Three or four eggs are laid, as large as those of a hen, of a chalky white surface, varied with pale blue.



SHAG.

"The most extensive colony," observes Sir William Jardine, "which has ever come under our observation, is one in the Isle of Man, on the precipitous coast adjacent to the Calf, of such elevation that the centre was out of range, either from the top or from the sea; there they nestled in deep horizontal fissures, conscious apparently of their security, and would poke out their long necks, to ascertain the reason of the noise below, or when a ball struck the rock near them, with the hope

of causing them to fly. There were hundreds of nests, and the birds not sitting kept flying in front of the rock, passing and repassing so long as any thing remained to disturb them. On approaching this resort, and also at a similar, but smaller, one on St. Bee's Head, few of the birds quitted the rock; but at the surprise of our first shots, they fell, as it were, or darted straight to the water, some of them close to the boat, so much so as at first to cause us to think that great havoc had been made; in which we were soon undeceived, by seeing numerous heads appearing at a distance, and the birds immediately making off in safety. They soon, however, learned to sit and look down in content, though at new stations we procured specimens by one firing at the rock, and another taking the birds as they darted to the water. Caves are also resorted to as breeding places by this bird, on the ledges of which the nest is placed. On the Bass Rock, and the Isle of May, where only a few resort, they select the deep caves: and a boat, stationed at the entrance, but out of sight, may some times procure shots at the disturbed birds flying out, although they more frequently dive into the water of the cave, and swim under until far past the entrance." *

As an example of the great depth to which marine diving birds will descend in pursuit of prey, Mr. Yarrell mentions that the Shag has been caught in a crab-pot fixed at twenty fathoms, or one hundred and twenty feet below the surface.

We may here allude to some observations by

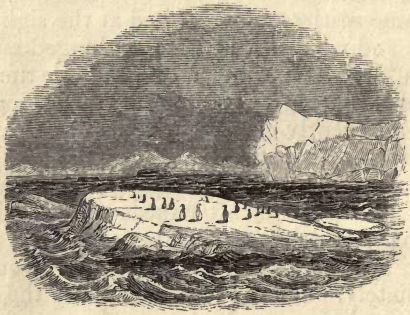
* Nat. Lib. ORNITHOLOGY, iv. 240.

Colonel Montagu on a Cormorant, which, though not of the present species, was nearly allied; and with these notes we close our volume on Birds. A specimen of the Great Cormorant (*P. carbo*, Linn.) kept by him was extremely docile, of a grateful disposition, and by no means of a savage or vindictive spirit. He received it by coach after it had been twenty-four hours on the road; yet though it must have been very hungry, it rejected every sort of food he could offer to it, even raw flesh; but as he could not procure fish at the time, he was compelled to cram it with raw flesh, which it swallowed with evident reluctance, though it did not attempt to strike him with its formidable beak. When removed to the aquatic menagerie, it became restless and agitated at the sight of the water, and when set at liberty plunged and dived without intermission for a considerable time, without capturing or even discovering, a single fish; when, apparently convinced that there were none to be found, it made no farther attempt for three days.

Colonel Montagu afterwards noticed the dexterity with which it seized its prey. If a fish was thrown into the water at a distance, it would dive immediately, pursuing its course under the surface, in a direct line towards the spot, never failing to take the fish, and that frequently before it reached the bottom. The quantity it would devour was astonishing; three or four pounds twice a-day were swallowed, the digestion being excessively rapid. It lived in perfect harmony with the wild Swan, wild Goose, Ducks of various species, and other birds, but to a Gull with a piece of fish it would instantly give chase; in this it seemed

actuated by a desire to possess the fish, for if the Gull had time to swallow it, no resentment was manifested. Apparently the sight of the fish created a desire of possession, which ceased when it had disappeared.*

* Ornith. Dict. 102.



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